U.S. EPA
CERCLA SECTION 104(c)
INFORMATION REQUEST

Please note: This Information Request includes instructions for responding to this request and definitions of words such as "Respondent," "Property," "Material," "Identify," and "Investigation Area" used in the questions. Please provide responses to all the questions in this Information Request for each Property identified in response to Question 4 of Section 2.0, when appropriate. You must answer the Questions in this Information Request related to properties or facilities outside the Investigation Area if Question 4, Section 2.0 specifically instructs you to do so. For each response clearly identify the Property or Properties to which the response applies.

INFORMATION REQUEST QUESTIONS

Preliminary note: Many technical documents that have been provided to EPA or to DEQ also contain subparts that are responsive to more than one discrete question (for example, questions seeking maps and photographs). These technical documents are produced where they are relevant to the question as an entire document. Consistent with EPA's instruction that it does not want duplicative information, maps, photographs, and other document subparts are identified as supporting additional questions only where the map or photograph is particularly helpful or adds factual information.

Section 1.0 Respondent Information

1. Provide the full legal, registered name and mailing address of Respondent.

   Response:

   Siltronic Corporation
   7200 NW Front Avenue
   Portland, OR 97210

   Registered Agent:
   MN Service Corp.
   111 SW Fifth Avenue, #3500
   Portland, OR 97204

2. For each person answering these questions on behalf of Respondent provide:

   a. full name;
   b. title;
   c. business address; and

d. business telephone number, electronic mail address, and FAX machine number.

Response:

Tom McCue
Manager, Environmental Affairs
Siltronic Corporation
7200 NW Front Ave., M/S 20
Portland, OR 97210-3676
Phone 503-219-7532
Fax 503.219-7599
tom.mccue@siltronic.com

In addition to Mr. McCue, the following other Siltronic personnel have assisted in answering these questions on behalf of respondent. Please contact any of these persons in care of Mr. McCue (email and phone above) or in care of Counsel (contact information below), to ensure that Environmental Affairs is aware of any supplemental information requests from EPA to Siltronic.

Clayton Able
Equipment Engineer

Brian Bailey
Health & Safety Engineer,
ERT Coordinator

Chris Barbero
Lab Services Manager

Elaine Beauregard
Engineering Documentation Supervisor

Sandra Bienert-Nigl
Executive Assistant (Munich, Germany)

Nick Bloom
Maintenance Technician

Myron Burr
Environmental Engineer

Larry Buzan
Director Site Engineering & Maintenance

Jim Claxton
Lab Services Engineer

Gary Dalrymple
Project Engineer

Christopher (Justin) Darr
Facilities Operations

Glen DeWater
Clean Operations

Dale Engele
Retired

Tom Fahey
Director, Human Resources

Nick Frederick
Purchasing Manager

Matthew Freeland
Fab 2 Maintenance Team Leader

Gary Harinski
Tax Accountant

Colleen Hoyt
Financial Accounting Manager

Candyce Hoeye
Administrative Assistant to CEO

Rainer Irle
CFO

Fumitoshi Ito
Quality Assurance Team Leader

John Johnsen
Facilities Maintenance Supervisor

Craig Jordan
Health & Safety Engineer

Moe Khorsandian
Facilities Engineering Team Leader & Plant Electrical Engineer

Vernon Knepprath
VP Operations Fab 1

Kristy Latiolais
Sr. Personnel Specialist

Koreen Lail
Environmental Engineer

Lisa McClendon
Commodity Base Manager

Steve McMahen
Facilities Maintenance Technician

David McNinch
Procurement and Logistics

Neil Nelson
President and CEO

Dwain Oster
Director, Portland Quality Management

Todd Potter
Fab 1 Maintenance Manager

Ben Rigall
Personnel Specialist

Cheri Robison
Human Resources Manager

M. Roeker
Financial Systems Analyst II

Michelle Rose
Manager Personnel Training and Development

Tom Rothschild
Facilities Chemist

Elaine Stache
Tech, Process III

Virginia Thompson

Executive Secretary

Jason Van Horn
Fab 1 Team Leader

Gerd Winnefeld
HR Director (Burghausen, Germany)

In addition, the following consultants and attorneys have assisted in the preparation of this response:

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3. If Respondent wishes to designate an individual for all future correspondence concerning this Site, please indicate here by providing that individual's name, address, telephone number, fax number, and, if available, electronic mail address.

Response:

Neil Nelson
President & CEO
c/o Siltronic Corporation
7200 NW Front Ave., M/S
Portland, OR 97210-3676
Telephone: 503-219-7500
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Section 2.0 Owner/Operator Information

4. Identify each and every Property that Respondent currently owns, leases, operates on, or otherwise is affiliated or historically has owned, leased, operated on, or otherwise been affiliated with within the Investigation Area during the period of investigation (1937 - Present). Please note that this question includes any aquatic lands owned or leased by Respondent.

Response:

Respondent Siltronic Corporation, formerly known as Wacker Siltronic Corp., currently owns a single undivided parcel of real property within the Investigation Area, commonly referred to as 7200 NW Front Avenue in Portland, Oregon, which it acquired in 1978. The property is variously described in documents included in the response to this information request as ranging in size from about 78 acres to 85 acres. The Metro-Regional Land Information System (RLIS) database lists the property as 79.35 acres. A complete legal description is included in the response to Question 13a, and a description of the nature of Siltronic's ownership interest referencing copies of legal instruments is included in response to Question 7. The legal description of said property includes certain aquatic lands; however, a more detailed explanation of the status of such ownership of aquatic lands is contained in the response to Question 14. Additionally, Siltronic has an easement over certain submerged and submersible land which was granted by the Oregon Department of State Lands for Siltronic's treated wastewater outfall as described in responses to Questions 7, 14 and 18.

5 . Provide a brief summary of Respondent's relationship to each Property listed in response to Question 4 above, including the address, Multnomah County Alternative Tax lot Identification number(s), dates of acquisition, period of ownership, lease, operation, or affiliation, and a brief overview of Respondent's activities at the Properties identified.

Response:

Siltronic Corporation
7200 NW Front Avenue
Portland, OR 97210-3676

The primary account number for Multnomah County property tax is R324183 (Land & Improvements). Other sub-account numbers covering the property are R324184, R533597 and R567118. Those accounts are stated to include 77.69 acres. There is another small parcel under account R324219 listed as 0.68 acres. As stated in response to Question 4, the total acreage is variously described as ranging from the 78.37 acres totaled from the property tax accounts to about 85 acres in other historical documents. The RLIS database indicates that the Property is 79.35 acres.

The City of Portland sold the land to Siltronic Corporation, previously Wacker Siltronic Corporation, August 17, 1978. Siltronic Corporation has been the sole owner since that date. Documents supporting the details of the transaction and a longer explanation are provided in response to questions 7 and 10a.

The property is used for the manufacture of silicon wafers for the electronics industry.

6. Identify any persons who concurrently with you exercises or exercised actual control or who held significant authority to control activities at each Property, including:

a. partners or joint venturers;
b. any contractor, subcontractor, or licensor that exercised control over any materials handling, storage, or disposal activity on the Property; (service contractors, remediation contractors, management and operator contractors, licensor providing technical support to licensed activities);
c. any person subleasing land, equipment or space on the Property;
d. utilities, pipelines, railroads and any other person with activities and/or easements regarding the Property;
e. major financiers and lenders;
f. any person who exercised actual control over any activities or operations on the Property;
g. any person who held significant authority to control any activities or operations on the Property;
h. any person who had a significant presence or who conducted significant activities at the Property; and
i. government entities that had proprietary (as opposed to regulatory) interest or

involvement with regard to the activity on the Property.

Response:

a. Siltronic has not had any past or present partners or joint venturers.

b. Siltronic maintains control over the work performed by all contractors while onsite. Licensors providing and maintaining bulk gas supply equipment on Siltronic property are identified below. Materials delivery to designated areas other than the receiving area is allowed for certain bottles gases and bulk gas or chemical deliveries. All bulk chemical suppliers are also identified below.

Contractors and their subcontractors that perform work on the Siltronic property are controlled by specific contract, purchase order or work order. In all cases a scope of work is agreed to before the work is authorized. At times resident contractors have an office or staff onsite on a long-term basis during construction of new facilities or major modifications. No contractor exercises actual control over the property except to provide defined specialty services. Construction activities and resident general contractors include the following. Subcontractors were under the control of the general contractor and all were subject to the terms of the master agreement, purchase order or work order issued by Siltronic.

Fab building design was conducted by Industrial Design Corporation (IDC)/CH2M Hill, including procurement of the building and environmental and land use permits and building permits related to site development. Hoffman Construction Company of Oregon constructed the Fab, along with subcontractors and vendors chosen by Hoffman with approval of Siltronic.

Gas suppliers of bulk gases provide storage tanks and gasification equipment to connect to gas distribution systems. Bulk gas storage tanks and evaporator coils are the property of the gas supplier. Bulk gas supply systems are specialty equipment. The equipment is leased from the supplier and the maintenance, filling, and technical support is provided by the supplier. The following gas suppliers have owned and maintained equipment on the Siltronic property.

Engineering Design

CH2MHILL – Building and infrastructure design, permitting services
2020 SW Fourth Ave., Portland. OR 97201
Industrial Design Corporation - Building and infrastructure design (formerly part of CH2MHILL)
2020 SW Fourth Ave., Portland, OR 97201
Hoffman Construction Corporation – Building Construction
1300 SW Sixth Ave., Portland, OR 97207
Coffman Excavation – Excavation subcontractor to Hoffman
13014 Clackamas River Dr., Oregon City, OR 97045
American Diving Service, Inc. - River bank repair
415 S McLoughlin Blvd. Oregon City, OR 97045

Harder Mechanical Contractors, Inc. - Piping fabrication
2148 NE MLK Jr. Blvd. Portland, OR 97212

Gases: Linde (formerly BOC) (formerly Air Co.)
$SiHCl_3$, HCl, SiH_4
Dopants: NF_3, NO_2
Praxair (formerly Linde) (Past)
H_2 (Hydrogen), N_2 (till 2000)
Air Products
H_2 (Hydrogen)
Air Liquide
N_2
Polar Cryogenics
Oxygen

Chemical deliveries are managed for "just-in-time delivery" of chemicals to limit the quantity of chemicals onsite at any time. Chemical suppliers manage chemical inventory onsite by daily deliveries from off-site chemical warehousing to point-of-use or onsite chemical storage areas. Maximum and minimum quantity on hand and reorder points are set by contract agreements. Generally the chemical supplier has title and control of chemicals while on their truck even when the chemical delivery truck in on Siltronic property. Once off loaded the responsibility transfers to Siltronic. These terms are set by contract. Bulk liquid chemical suppliers retain control over the chemical until it is transferred into the bulk chemical storage tank. Bulk chemical suppliers provide the following chemicals. All of these suppliers had control over chemicals as they entered the plant site. All bulk chemicals were held in the trucks until QA testing was complete and the chemical was allowed to be off-loaded. At that point ownership transferred to Siltronic. If the QA failed the load was not accepted and control/ownership remained with the supplier

Bulk Liquid Chemicals:
Univar (formerly Van Waters and Rogers) 3950 NW Yeon Ave., Portland, OR – Spent HNO_3, HF, NaOH, H_2SO_4, NaOCl, Na_2S, HCl, TCE
Matlock Inc. 8101 NE 11th Ave., Portland, OR- TCE transporter
General Chemical: HF, HNO3
TSDF and Waste management contractors are used to transport, treat or recycle wastes and dispose of waste materials. The listed of past and present TSDFs are in SCOEPA00115581.

c. None

d. Portland General Electric was granted two easements on October 12, 1978: "Electric Power Substation Easement" and "Electric Power Line Easement". These easements are located in the Northwest corner of Siltronic property near the termination of Front Avenue, as described in the legal description included with each easement and the easement drawing. See the following: "Substation Easement" (SCOEPA00002016) , "Power Line Easement"(SCOEPA00002011) and "Dwg PGE Easement"(SCOEPA00002009) .

A 100 foot wide utilities easement crosses Siltronic property from the Northwest corner of the property, near the termination of Front Avenue, to the Eastern property line boundary at approximately 1,150 feet from the Northeast harbor line. This easement is shared by the following parties: City of Portland, Northwest Natural, and Olympic Pipeline. Underground utilities in this easement include the following: 24" water main, 8" fire main, 36" sanitary sewer, 10" natural gas, and 2-14" petroleum pipelines. See Siltronic drawings "GRA-522, Overall Site Plan" (SCOEPA00002010) and "1C1, Site Civil Site Plan" (SCOEPA00112101) for the details of this easement. Said easement is incorporated within the Bargain and Sale Deed dated August 17, 1978, encompassing a portion of the Property vacated by Ordinance No. 146216 of the City of Portland, and thereby subjected the property then acquired by Siltronic to an easement for existing utilities, and future installation and maintenance of additional utilities together with all conditions and restriction contained in that Ordinance. Names and addresses of parties with utilities within the easements:

Portland General Electric
121 SW Salmon Street
Portland, OR 97204

City of Portland
1120 SW 5th Ave.
Portland, OR 97209

Northwest Natural
220 NW 2nd Avenue
Portland, OR 97204

Olympic Pipeline Co.
5005 Business Park North
Bakersfield, CA 93309

e. The original financing of the site was a combination of various Bank Loans, Wacker Chemical Affiliate loans, Industrial Development Bonds issued by the Port of Portland and Pollution Control Revenue Bonds issued by the Port of Portland. Portions of the bank loans were guaranteed by Wacker Chemie GmbH. Funds provided from the issuance of the Industrial Development and Pollution Control Revenue Bonds are restricted to qualified expenditures as defined in the bond agreements and are secured by the Company's manufacturing facility in Portland, Oregon.
The financing for Fab 2 was a combination of a Demand line of credit with Wacker Siltronic AG, Wacker Semiconductor Corporation Notes Payable, and multiple revolving credit facilities with various banks. The bank revolving credit facilities, with the exception of the Bancroft bond, are guaranteed by Wacker Siltronic AG.
Current financing is through a short term borrowing agreement with Siltronic AG. In addition, the Company has access to a revolving credit facility with a bank, which is guaranteed by Wacker Chemie AG. Currently, the revolving credit facility is not utilized.

Siltronic is providing a complete answer on major financiers and lenders. However, Siltronic does not believe that any financier or lender identified "exercises or exercised actual control or . . . authority to control activities at the property."

f.-h. For questions 6f through 6h, the responses to questions 10 and 11 identify historical owners and operators who exercised actual control, had significant authority, maintained a significant presence or conducted significant activities on the property until purchase by Wacker Siltronic. However, the names of specific persons in these roles in other organizations (e.g., NW Natural and its predecessors, SLLI and its predecessors) are not included herein, as it is expected that the 104(e) responses from those adjacent entities will provide that information.

For 6i, the following government (understood to mean not privately held) entities that have had a proprietary interest in the property include:

1. The City of Portland
2. The Portland Development Commission
3. The State of Oregon
4. The Port of Portland.

7.. Identify and describe any legal or equitable interest that you now have, or previously had in each Property. Include information regarding the nature of such interest; when, how, and from whom such interest was obtained; and when, how, and to, whom such interest was conveyed, if applicable. In addition, submit copies of all instruments evidencing the acquisition or conveyance of such interest (e.g., deeds, leases, purchase and sale agreements, partnership agreements, etc.).

Response:

Siltronic acquired ownership of the Property pursuant to a Bargain and Sale deed that conveyed ownership from the City of Portland acting by and through the Portland Development Commission as the duly designated Urban Renewal Agency of the City of Portland. That deed was recorded on August 17, 1978. The transfer of title to Siltronic was for the purpose of carrying out the Urban Renewal Plan for the NW Front Avenue Industrial Renewal Project pursuant to an agreement between the parties dated May 26, 1978, which was recorded on June 2, 1978. That Urban Renewal Plan was adopted by the City of Portland under Resolution No. 32099 on May 11, 1978. The Bargain and Sale Deed of August 17, 1978, was subject to the rights of the State of Oregon to submerged lands below the low water mark, and certain easements including rights of the City for certain existing and future utilities along NW Front Avenue, and the rights of the City for construction and maintenance of a storm sewer over three specifically described parcels.

Subsequent to the conveyance by the City of Portland, Siltronic granted a perpetual easement to Portland General Electric Company on October 31, 1978, for the right to install and maintain an electric power substation on a portion of the Property. On April 7, 1979, Siltronic conveyed to the Port of Portland (Port) by Bargain and Sale Deed a tract of land consisting of about 0.68 acres, which Deed was recorded on April 26, 1978. This latter conveyance was to facilitate an Installment Sale Agreement between the Port and Siltronic for the construction of buildings and other improvements to be financed by the issuance of revenue bonds, as authorized by Port Ordinance No. 246 on April 26, 1979, and the sale of such improvement to Siltronic in furtherance of the Urban Renewal Plan.

On November 20, 1979, Siltronic, by Bargain and Sale Deed, conveyed to the City a tract consisting of approximately 0.112 acres, and on December 5, 1979, the City, by Bargain and Sale Deed, conveyed to Siltronic a tract consisting of approximately 0.094 acres. Those deeds were recorded respectively on December 11, 1979 and December 10, 1979.

On October 30, 1980, the City, acting through the Portland Development Commission, recorded a

Certificate of Completion constituting a conclusive determination of the satisfaction of all agreements, covenants and conditions contained in the Development Agreement, the Deed and the Urban Renewal Plan. On October 4, 2004, the Port conveyed to Siltronic by Bargain and Sale Deed the tract consisting of approximately 0.68 acres previously granted to the Port on April 7, 1979, in fulfillment of the requirements contained in the Installment Sale Agreement dated April 15, 1979.

On December 24, 1979 the State of Oregon, acting through the Division of State Lands (now known as the Department of State Lands; "DSL") granted an easement to Siltronic to maintain and operate an outfall for stormwater and permitted treated effluent over certain submerged and submersible lands owned by the State. DSL renewed that easement on December 19, 2006, for a term of 30 years.

All instruments conveying ownership described above are further described as part of the ownership history of the Property included in the response to Question 10a. Copies the above referenced instruments are included in the chain of title documents produced in response to Question 10a.

8. If you are the current owner and/or current operator, did you acquire or operate the Property or any portion of the Property after the disposal or placement of hazardous substances, waste, or materials on, or at the Property? Describe all of the facts on which you base the answer to this question.

Response:

Yes. Wacker Siltronic acquired the property in 1978. As later explained in 1985 by the Portland Development Commission (PDC) , prior to 1978, Northwest Natural (and its predecessor, Pacific Gas & Coke)1 used portions of the property and adjacent aquatic lands for MGP waste disposal from approximately 1940 or 1941 to 1956, when MGP operations ceased. Between then and Siltronic's purchase, MGP waste was spread across the site and covered with fill materials including Willamette River dredge spoils, which themselves may have contained hazardous materials. Siltronic first learned of these disposal activities several years after its purchase of the land, when the relevant facts were disclosed by PDC.

The PDC document also suggested that prior to Siltronic's purchase, portions of the Siltronic property had been impacted by releases from the adjoining Rhone-Poulenc pesticide facility, and by releases of wastewater from the Koppers facility located on the adjacent Northwest Natural property.

The following describes MGP waste disposal operations further.

1940 – 1956 Starting in 1940 or 1941, MGP waste was collected in two effluent settling ponds that occupied property on both sides of what later became the property boundary between Siltronic

1 For ease of reference, all companies are referred to by their most current name known to Siltronic. For example, "Northwest Natural" is used even where the actor was its predecessor, Pacific Gas & Coke.

and Northwest Natural. The effluent ponds discharged directly to the Willamette River. A much larger waste disposal lagoon was constructed on what is now the Siltronic property in about 1950. The waste disposal lagoon received overflow from the effluent ponds that had previously discharged directly to the river. An additional smaller waste disposal pond (located further east of the lagoon) is also visible in aerial photographs from the same time period. The effluent ponds and lagoon remained in place until approximately 1967.

The volume of waste disposed by PG&C on the Siltronic property is unknown. DEQ has estimated that the effluent ponds and lagoon contained at least 6 million gallons of liquid waste, including process water and MGP byproducts, and may have also contained as much as 3.9 million gallons of dry tar. Based on analysis presented in the Siltronic RI Report, estimated waste tar disposal volumes to the effluent ponds and lagoon may have ranged from between 7 and 17 acre-feet (i.e., approximately 2.2 to 5.5 million gallons) per year from 1940 to 1956.

1956 – 1978 MGP operations ceased in 1956, although liquid wastes remained in the ponds and lagoon until the mid-1960s. Following termination of MGP operations, the ponds were partially filled with the remaining MGP solid waste, including lampblack and spent oxide. The lagoon was not filled until 1971. The aerial photo history included in the Siltronic RI Report indicates that MGP waste from the Northwest Natural site was spread across the Siltronic property. Liquid wastes remained in the ponds and lagoon until about 1965.

During this time period operations on the site consisted mostly of filling. MGP waste was incorporated into the fill, along with quarry rock and overburden, and Willamette River dredge spoils (which likely included sediments impacted by direct discharge of MGP wastes and other sources). The initial fill estimate was 1,529,400 cubic yards. Port of Portland records indicate that 695,522 cubic yards of material dredged from the river were placed on the site. Review of aerial photographs indicates that the MGP waste and dredge spoils were spread across much of the eastern portion of the property. The use of MGP waste as fill has resulted in documented impacts to soil and groundwater across the majority of the Siltronic property.

The Rhone-Poulenc releases also resulted in documented impacts to groundwater and soil on the Siltronic property. At this time, data are not available to confirm or refute soil or groundwater contamination on Siltronic property resulting from the adjacent Koppers facility or from other nearby impacted properties, including the former NL Industries NPL site and the former ESCO landfill.

9. At the time you acquired or operated the Property, did you know or have reason to know that any hazardous substance, waste, or material was disposed of on, or at the Property? Describe all investigations of the Property you undertook prior to acquiring the Property and all of the facts on which you base the answer to this question.

Response:

No. Prior to acquisition of the Property on August 17, 1978, no official, agency, consultant, or any other person told Wacker Siltronic (now known as Siltronic) or its parent company, (collectively referred to as “Wacker”) of the existence of any hazardous substance in the soil or

water beneath the site, or provided any reason for Wacker to suspect the existence of such contaminants so as to warrant testing or further investigation. On the contrary, officials with the City of Portland and its development agency, Portland Development Commission (PDC), told Wacker in response to its inquiries that the Property was vacant, undeveloped land, which had not formerly been used for any industrial purpose. The Property was inspected by Wacker representatives on foot and by helicopter. At that time, the Property was an almost level, grass covered site that had been filled by prior owners, which, unbeknownst to Wacker, had buried various contaminants many feet beneath the surface.

Wacker's purchase of the Property occurred two years before the enactment of CERCLA. Dr. Hans Herrmann, Wacker's principal representative involved with choosing, purchasing and developing the site, attested that he had no knowledge of the presence of hazardous substances. Wacker's legal counsel in connection with the purchase, Harvey Barragar, of Miller Nash Wiener Hagan & Carlsen, also asserted that he had no such knowledge and did not know or learn of anything from any source that caused him to suspect that there might be hazardous substances on or under the Property prior to Wacker's purchase. According to Mr. Barragar, who at the time had practiced real estate law in the Portland area for over 25 years, before the early 1980s the standard practice was for prospective purchasers to conduct soil testing only to determine load-bearing characteristics of undeveloped land prior to purchase.

Prior to purchase, Wacker contracted with CH2M Hill, consulting engineers, for assistance in assessing the suitability of the Property, estimating costs for the prospective facility, design of the facility and assistance in obtaining building and environmental permits. During 1977 and 1978, CH2M Hill discussed permitting with DEQ and other agencies, inspected the site on a number of occasions, and performed vibration and geotechnical investigations. Those geotechnical investigations included boring of a number of test holes. Notwithstanding indications of the presence of "bitumen" in boring logs included in that investigation report, Richard Reid, project manager for CH2M Hill, advised Wacker that prior to purchase, CH2M Hill did not know of any hazardous substances and knew nothing about the site from which Wacker should reasonably have known of such contamination at the site.

During that time period, CH2M Hill and Wacker's knowledge consisted of what they had been told by various officials: that the site was undeveloped land that had once been low-lying, marshy land along the Willamette River and that it had been filled for future industrial development by previous owners. The PDC had acquired the site from previous owners, assembling it from three parcels, with the intention of reselling it shortly thereafter to Wacker as part of an urban renewal and economic development project. Wacker Siltronic's parent company of Munich, Germany, had been seeking a location in the United States for a new plant to manufacture silicon wafers for its U.S. market. It also envisioned that the plant might later be expanded to manufacture polysilicon ingots from raw silicon materials. Many U.S. cities competed to attract this high-tech business. Wacker was courted by a delegation of officials, including then Governor Straub, Portland Mayor Goldschmidt, officials from the Port of Portland, the City of Portland, the PDC and the Chamber of Commerce. The goals of that urban renewal project including revitalization of an underutilized section of the industrial area and concomitant increase in the property tax base and creation of hundreds of prospective jobs.

Discussions led to an agreed cooperative effort to achieve those urban renewal and job creation

objectives. As part of that project, the City agreed to make the site suitable for industrial use by providing road, utility and sewer access, and paying for pre-loading of a previously-filled area of the site sufficiently to provide adequate foundation strength for Wacker's proposed facility. The City also organized a special job training effort through Portland Community College. Through the PDC, the City undertook to acquire and resell the Property to Wacker, Wacker, for its part, agreed to build the new plant, hire qualified Portland area residents to staff it, and guarantee the tax increment bonds issued by the City to finance acquisition and improvements.

During discussions, Wacker inquired about environmental requirements and was advised by Oregon DEQ, City of Portland, U.S. Army Corps of Engineers, and the Port of Portland. In early 1978, DEQ even sent representatives to Wacker's facility in Germany to advise it about environmental rules and permitting. Throughout all those discussions, Wacker was not informed of any hazardous substances in the soil or water at the site, nor was it given any reason to think that it needed to investigate for such presence since Wacker had been told that the site was undeveloped, with no prior industrial use. PDC's Executive Director at the time of sale, J. David Hunt, stated in a telephone interview in 1988, that at the time of sale in 1978, he was not aware of any contamination at the site. The first evidence of PDC's knowledge appears in a site history assembled by that agency in 1985. See SCOEPA 0124876 – 0124899.

Wacker first heard of the possibility of manufactured gas plant (MGP) wastes in the form of oil/tar residues on the Property many years after purchase, and confirmed the presence of those and other hazardous substances in 1985, soon after it publicly announced a tentative plan to expand by constructing a polysilicon manufacturing plant on an unused portion of the site. On the heels of the press report, Northwest Natural Gas informed Wacker that its predecessor, Portland Gas and Coke Company, had disposed of MGP wastes on portions of what had become Wacker's property, and that those wastes were subsequently buried under fill materials.

The above summary, which outlines Wacker's lack of pre-purchase knowledge of contamination and it reasonable inquiry into previous uses and ownership consistent with good commercial practices existing in 1978, was presented to EPA and DEQ in 1988 and 1989, during those agencies' efforts to identify potentially liable parties in association with the Doane Lake Study Area and NL/Gould sites. Both agencies released Wacker from obligations to participate in further investigation of those sites. Nonetheless, on the basis of reference to "bitumen" in the boring logs included in the CH2M Hill geotechnical investigation, DEQ questioned whether Siltronic had adequately undertaken pre-purchase inquiry SCOEPA00003441 and SCOEPA00003442.

Documents supporting the above discussion are included in letters and memoranda prepared in 1989 by Wacker's then legal counsel, Marvin K. Durning, and source documents appended thereto, all of which appear as Documents SCOEPA00017107 through SCOEPA00017148 and SCOEPA00017149 through SCOEPA00017272.

10. Identify all prior owners that you are aware of for each Property identified in Response to Question 4 above. For each prior owner, further identify if known and provide copies of any documents you may have regarding:

a. the dates of ownership;
b. all evidence showing that they controlled access to the Property; and
c. all evidence that a hazardous substance, pollutant, or contaminant, was released or threatened to be released at the Property during the period that they owned the Property.

Response:

A. **Current names of prior owners.**

The ownership history of the Property is complex, as it appears to have been assembled from three parcels, each of which underwent numerous ownership changes over time, including transactions that conveyed only portions of the respective parcel. A summary of the historical ownership is presented in the table below. This table, which was prepared by Siltronic's consultant, Maul Foster & Alongi, Inc. (MFA) from chain of title documents, was extracted from the Revised Siltronic Site Summary previously submitted to EPA in November 2006 by the Lower Willamette Group (LWG).

A. Owner/Occupier	Year Interest Acquired	Year Interest Transferred	B. Evidence of Controlled Access	C. Evidence of Release
1. (b) (6) (b) (6)	Unknown	1918 to Porter Industrial Co.	Chain of Title	Unknown
2. Porter Industrial Co., a corporation	1918	Unknown	Chain of Title	Unknown
3. Martin T. Pratt, Sheriff of Multnomah County (Foreclosure Sale)	Unknown	1937	Chain of Title	Unknown
4. Alice B. Allen	1937 – from Sheriff Pratt	1939 to PG&C	Chain of Title	Unknown
5. Portland Gas and Coke ("PG&C") Northwest Natural, an Oregon corporation	1939 Unknown	1960 portion to RA&S 1968 portion to Western	Chain of Title	Substantial and confirmed; see response to Question 16.
6. Union Oil Co. of California (Quit Claim)	Unknown	1940 to Springmann	Chain of Title	Aerial photo review
7. Standard Oil of California	Unknown	1943 to Spear and McCord	Chain of Title	Aerial photo review
8. David L. Springmann Irene C. Springmann	1940 from Union Oil	1943 to Western	Chain of Title	Unknown
9. Charles W. Spear Edith B. McCord	1943 from Standard Oil	1943 to Western	Chain of Title	Unknown

A. Owner/Occupier	Year Interest Acquired	Year Interest Transferred	B. Evidence of Controlled Access	C. Evidence of Release
10. Western Transportation Co., an Oregon corporation	1943 from Springmann, Spear and McCord, Northern Pacific	1968 to RA&S	Chain of Title	Aerial photo review
11. Northern Pacific Railway Co., a Wisconsin corporation	Unknown	1943 portion to Western Transportation 1964 portion to R&A	Chain of Title	Unknown
12. A. Victor Rosenfeld ("R"), H.A. Andersen ("A") Gilbert Schnitzer ("S") [Multiple transfers in 1964 among the 3 individuals]	1960 from multiple transferors	1972 to City of Portland	Chain of Title; SDMS 1187513	Substantial; see response to Question 16
13. Spokane, Portland and Seattle Railway Co., a Washington corporation	Unknown	1964 to R&A 1978 – Quitclaim to City of Portland	Chain of Title	Unknown
14. Rosenfeld Investment Co.	Unknown	1964 to Rosenfeld, individually	Chain of Title	Substantial; see response to Question 16
15. Koppers Co., Inc., a Delaware corporation – LESSEE	1965 – Northwest Natural's Lessor	Unknown	Chain of Title	Substantial; see response to Question 16
16. City of Portland, an Oregon municipal corporation	1972 from RA&S and Crown Zellerbach	1978 to Wacker Siltronic	Chain of Title; SDMS 1187513	Substantial; see response to Question 16.
17. Crown Zellerbach Corporation, a Nevada corporation	1974 from Western	1978 to City of Portland	Chain of Title	None available for 1974-1978
18. Port of Portland, an Oregon municipal corporation	1979 from Wacker	2004 to Siltronic	Chain of Title	Unknown
19. City of Portland, an Oregon municipal corporation	1979 from Wacker	Unknown	Chain of Title; SDMS 1187513	Unknown

It should be noted that Georgia Pacific (a subsidiary of Koch Industries) is the successor to Western Transportation and Crown Zellerbach Corporation. It should also be noted that

Burlington Northern Santa Fe Railway is the successor to the Northern Pacific Railway Company and to the Spokane, Portland and Seattle Railway Company. Northwest Natural is the successor to Pacific Gas & Coke.

B. Evidence supporting ownership and control.

Documents supporting this ownership history were assembled as part of the Recorded Document Guarantee pursuant to the title insurance policy issued to Siltronic by Oregon Title Insurance Company and the Schedule of Documents appended thereto. That Schedule and the documents included in the recorded chain of title are included in the documents produced in response to this request and in response to Question 13, below. A draft ownership flow chart, which was assembled in 2007, is also included in the responsive documents, notwithstanding acknowledged uncertainties stemming from the assembly of disparate parcels that have not been mapped.

C. Evidence of Releases

Portland Gas and Coke ("PG&C") Northwest Natural, an Oregon corporation	Substantial and confirmed releases of Manufactured gas product wastes, lamp black, spent oxides, oil and tar residue, cyanide containing materials and BTEX compounds; see response to Question 16.
. Western Transportation Co., an Oregon corporation	Potential fuel oil releases
A. Victor Rosenfeld ("R"), H.A. Andersen ("A") Gilbert Schnitzer ("S")	Fill and site development activities
. Koppers Co., Inc., a Delaware corporation	Light distillates from the processing of MGP materials and product wastes
Chipman Chemical	Release or spill of pesticide or herbicide to North Doane Lake which drained to a creek crossing Siltronic Property
City of Portland, an Oregon municipal corporation	Leak of 96 inch corrugated drainage pipe from North Doane Lake
US COE	Placement of dredge spoils onto the property from the Willamette River

The primary known releases to the environment occurred during Northwest Natural's ownership of the property, with substantial waste material from Northwest Natural incorporated into fill during subsequent ownership by Anderson, Rosenfeld, and Schnitzer. Significant releases may have also occurred during filling activities the 1970s and during dredging operations offshore.

Evidence of these releases is noted in column C of the table provided in response to section 10 A above, included in documents identified in the response to Question 16, and reports generated during the investigations identified in the response to Question 71. Evidence of the releases includes the following types of information:

a. Individual accounts or recollections
b. Aerial photographs and other historical documents
c. Analytical data collected by various property owners
d. Reports and other documents prepared by or on behalf of former and current property owners and certified by competent professionals

e. Reports and other documents prepared by or on behalf of regulatory agencies

Evidence of releases related to the tugboat refueling operations is limited and potential releases have not been confirmed by investigations to date.

11. Identify all prior operators of the Property, including lessors, you are aware of for each Property identified in response to Question 4 above. For each such operator, further identify if known and provide copies of any documents you may have regarding:

a. the dates of operation;
b. the nature of prior operations at the Property;
c. all evidence that they controlled access to the Property, and
d. all evidence that a hazardous substance, pollutant, or contaminant was released or threatened to be released at or from the Property during the period that they were operating the Property.

Response:

Prior owners identified in response to Question 10 above are also considered operators for the time periods shown on the table. In addition, owners of adjoining or nearby properties are considered to be operators to the extent that they allowed the release of hazardous substances, pollutants, or contaminants that directly impacted or had the reasonable potential to impact soil or groundwater on the Siltronic property.

The following additional operators have been identified:

1) SLLI (Starlink Logistics, Inc.) and/or Bayer Crop Science, Inc. (formerly known as Aventis Crop Science, Rhone-Poulenc AG Company (RPAC), Rhodia, Chipman Chemicals) operated on property adjoining the BNSF property to the south from approximately 1943 to 1991. The nature of operations included herbicide and insecticide formulation. As documented by analytical data, releases of herbicide and/or insecticide products and/or byproducts on or adjacent to the SLLI property have resulted in impacts to soil and groundwater on the Siltronic property. These releases have been confirmed by the discovery of buried drums and other pesticide containers in soil that is hydraulically upgradient of the Siltronic property.

2) The U.S. Army Corps of Engineers (COE – Portland District) used the Siltronic property for disposal of dredge spoils generated from dredging operations in the Willamette River between approximately 1971 and 1977. According to records submitted to PDC by the Port of Portland, approximately 695,522 cubic yards of dredge spoils were placed on the Siltronic property by the COE. Aerial photographs confirm the dredge spoil placement operations. The specific origin of the dredge spoils (with respect to river mile) is unknown, but it is reasonable to assume that dredge spoils originated from sediment near and offshore of the Siltronic property. Based on the potential source of dredge spoils, it is likely that these operations resulted in a release of contaminated sediment to the uplands.

3) Koppers Inc. (now known as Beazer East, Inc.) leased a portion of the Northwest Natural property adjacent to the Siltronic property. Koppers produced chemical oil, creosote, and

pitch from petroleum distillates from approximately 1966 to 1973, and production of electrode grade pitch from 1974 to 1977. Operations included disposal of process water to ground. Stormwater and process water were also discharged to a drainage ditch that crosses the Siltronic property prior to discharging to the Willamette River via a City of Portland outfall. DEQ documents confirm the disposal operations and the presence of polycyclic aromatic hydrocarbons (PAHs) in soil and groundwater impacted by process water disposal. Aerial photos document the construction of the ditch connecting Koppers to North Doane Lake in 1964; this ditch has been renamed Doane Creek.

4) The City of Portland constructed an 84" concrete outfall (Outfall 22C) that drains Highway 30, North Doane Lake and Doane Creek. The outfall was constructed in approximately 1979-1980 and replaced a leaking 96" corrugated metal pipe that served the same function. The outfall pipe crosses a portion of the Siltronic property and the adjacent BNSF property. Based on information developed by Northwest Natural, the outfall pipe likely gains or loses water, depending upon the groundwater elevation. Stormwater (impacted by (a) traffic on Highway 30, (b) impacted stormwater from Koppers, or (c) North Doane Lake surface water impacted by RPAC-contaminants in groundwater) discharges to Siltronic property via leaks in the pipe. Due to the non-unique character of the contaminants, analytical data collected to date have not confirmed these discharges.

12. If not included in response to any of the previous questions, please describe the purpose and duration of each aquatic lands lease Respondent or the operator of Respondent's Properties) ever obtained from the State of Oregon and provide a copy of each application for and aquatic lands lease obtained.

Response:

Not applicable. Siltronic does not believe that any aquatic lands lease exists between Siltronic and the State of Oregon. As explained further in response to questions 14 and 24, Siltronic has an easement across certain aquatic lands of the State.

Section 3.0 Description of Each Property

13. Provide the following information about each Property identified in response to Question 4:

a. property boundaries, including a written legal description;
b. location of underground utilities (telephone, electrical, sewer, water main, etc.);
c. location of all underground pipelines whether or not owned, controlled or operated by you, including but not limited to an underground easement owned and operated by Olympic Pipe Line Company;
d. surface structures (e.g., buildings, tanks, pipelines, etc.);
e. over-water structures (e.g., piers, docks, cranes, etc.);
f. dry wells;
g. treatment or control devices (e.g., surface water, air,, groundwater, Resource Conservation and Recovery Act (RCRA), Transfer, Storage, or Disposal (TSD), etc.);

h. groundwater wells, including drilling logs;
i. storm water drainage system, and sanitary sewer system, past and present, including septic tank(s) and where, when and how such systems are emptied and maintained;
j. subsurface disposal field(s), Underground Injection Control (UIC) wells, and other underground structures (e.g., underground storage tanks (USTs); and where they are located, if they are still used, and how they were closed;
k. any and all major additions, demolitions or changes on, under or about the Property, its physical structures or to the Property itself (e.g., stormwater drainage, excavation work); and any planned additions, demolitions or other changes to the Property;
1. all maps and drawings of the Property in your possession; and
m. all aerial photographs of the Property in your possession;
n. any and all additional information regarding but not limited to the following features:

    i. a liquefied natural gas plant;
    ii. production facilities that were razed in the late 1960s;
    iii. coal tar pits;
    iv. a new building built by Siltronic after the 1990s;
    v. settling ponds; and
    vi. any excavations adjacent to the Koppers Company property line.

Response:

To the extent that documents exist and the request applies to Siltronic and this property, documents are produced with this response.

13a. Please refer to title documents in the electronic submittal for this question and Question 7.

13b. Subsurface utilities are present throughout the site. Engineering design documents are included in the electronic submittal for this question. Buried utilities with the potential to be preferential pathways for contaminant migration to the Willamette River were identified in the LWG's Round 2 Report – Conceptual Site Model – Site Summary (CSM – SS).

13c. Subsurface pipeline drawings are included in the electronic submittal to this question. An existing 84-inch stormwater line owned by the City of Portland runs parallel to the eastern property and drains the North Doane Lake, A 100 foot utility corridor crosses the property in an east west direction. It contains a 10 inch gas line, 12 inch domestic water line, 36 inch sewer line, and two 14 inch oil pipelines owned by Olympic pipeline. As shown in the CSM Site Summary, the Olympic pipeline easement traverses the property approximately 1,000 feet upland of the riverbank and parallel to the Willamette River, and does not represent a preferential pathway for contaminant migration to the Willamette River.

13d. In general, many buildings and appurtenances (including tanks and piping) are present on the property. The principal buildings include Administration, Fab 1, Fab 2, water treatment, and the wastewater treatment plant. With the exception of the Administration building, these buildings are all connected by various conveyances (including pipelines). Several tanks are present as well. All hazardous materials are contained within secondary containment.

13e. Not applicable. No over-water structures are present.
13f. Not applicable. No dry wells are present.
13g. Treatment and control devices:

Waste Water Control and Treatment

The silicon wafer manufacturing process generates waste water streams containing acids, bases, surfactants, suspended silicon solids, and organic components from polishing or cleaning solutions. Each of these waste streams is segregated at their sources within the process building and flow by gravity to separate forwarding sumps or directly to a domestic sanitary drain if appropriate. The chromic acid drain is isolated from all other systems. Wastewater containing spent chromic acid from a wafer testing area to a dedicated treatment system.

Drain Collection System and Treatment Methods

The following table lists the types of drain systems, the treatment given to each waste system, and its discharge point.

System	Description	Treatment	Discharge Point
CAD / CAED	Concentrated Acid Drain	• Neutralization • Fluoride precipitation	Willamette River
WAD	Weak Acid Drain	Neutralization	Willamette River
CCD	Concentrated Caustic Drain	Used for neutralization	• Willamette River • City of Portland
OWW	Organic Waste	Neutralization	City of Portland
North Sump and SSW	Silicon Solid Wastewater	Neutralization	City of Portland
BD	Blow Down	Mixes with combined effluent	Willamette River
D	Domestic	None	City of Portland
CAW	Chromic Acid Waste Drain	None	Chromic Acid waste solution shipped off-site as hazardous waste
Fab 2 SWW	• Silicon solids • Waste water	Neutralization	Willamette River

Air Pollution Control Devices

Significant air discharges are controlled by scrubbers. The largest group of scrubbers are dedicated tool specific water based counter-flow scrubbers to control HCl emissions from Epitaxial Deposition reactors (EPI). The water based scrubbers are 99.99% efficient at removing HCl. Blowdown or discharge from the EPI scrubbers is treated in the weak acid drain system at the waste water treatment plant. The full set of EPI scrubbers is listed in the table below.

Fab	EPI Reactor Type	Number	# of Scrubbers
1	AMT Reactors *Applied Materials Technology Model 7810* Single Chamber 1 Scrubber per Reactor Reactor #s: 1,2,3,4,5,6,7,8,10,12,14,16,18,20,22,24	16	16
1	ASM Reactors *Epsilon 2* Single Chamber 1 Scrubber per Reactor	14	14

	Reactor #'s: 13,15,17,19,21,23,25,26,27,28,30,32,40,41		
1	G-3 Reactors *Concept Technology → Matteson Technology* 2 Chambers per Reactor 3 Scrubber per Reactor Reactor #'s: 9,11,42,43,44,45,46,47	4	12

Total Fab 1 EPI Reactors: 34 **Total Fab 1 EPI Scrubbers: 42**

Fab	EPI Reactor Type	Number	# of Scrubbers
2	ASM Reactors *ASM Epitaxy* Single Chamber 1 Scrubber per Reactor Reactor #s: 1,2,3,4,5,6	6	6
2	AMT Reactors *Applied Materials Technology* 3 Chambers plus 1 Transfer Section per Reactor 4 Scrubbers per Reactor Reactor #s: 8,9,10,11,12 (Reactor 8 is the newest)	5	20

Total Fab 2 EPI Reactors: 11 **Total Fab 2 EPI Scrubbers: 26**

General scrubber systems are used for process areas where several process steps require exhaust management. The Hazardous Production Scrubber (HPM), Acid Fume Scrubbers, and Final Cleaning Scrubber control emissions from wet baths where acids or caustic chemicals are used for wafer cleaning. The NOx Scrubber is used to control HNO_3 and HF emissions from Acid Etch operations. The HPM and EPI Gas Cabinet Scrubbers control cylinder gas emission during gas bottle changes and act as emergency exhaust scrubbers in the event of a valve failure or leaking pipe fitting. The TCS Scrubbers control vented trichlorosilane emissions during gas cylinder changes. A description of scrubber operation is included in the documents produced in response to this request labeled as Confidential Business Information..See SCOEPA00112445-SCOEPA00112452.

Fab	Scrubber	Number	# of Scrubbers
1 & 2	Hazardous Production Scrubber	1	1
2	TCS S-Vent	1	1
1	TCS Scrubber	1	1
2	TCS Emergency Scrubber	1	1

Fab	Scrubber	Number	# of Scrubbers
1 & 2	NOx Scrubber	1	1
1	Acid Fume Scrubber	1	1
1	EPI Gas Cabinet Scrubber	1	**1**

1	Final Cleaning Scrubber	1	1

Boiler emissions from natural gas fired boilers are controlled by Low-NOx burners and annual preventive maintenance measures.

Groundwater Treatment System

There are groundwater treatment systems installed at two locations to treat historical releases of Trichloroethylene (TCE). TCE use was discontinued in 1989. The installations are small scale pilot test areas, which have been demonstrated as effective at treatment of TCE and its degradation products (generally, cVOCs) to meet Joint Source Control Strategy Screening Level Values set by EPA and Oregon DEQ. Current plans are to expand these treatment areas to completely remove cVOCs from groundwater.

RCRA TSDF

There are no Resource Conservation and Recovery Act (RCRA), Transfer, Storage, or Disposal (TSD) facilities on site. All hazardous waste collection occurs in satellite or less than 90 day accumulation areas and storage of containerized accumulated hazardous waste occurs in a 90 day storage area. Shipments of hazardous waste occur within 90 days of filling each container.

13h. Please refer to drilling logs included in MFA reports, included in the response to Question 71.

13i. **Surface Water/Storm Water Control**

Surface water control systems are described in the Storm Water Pollution Control Plan P-27.10.02/0007. SCOEPA00112453-SCOEPA00112485. The purpose of the Storm Water Pollution Control Plan is to control hazardous materials and material handling activities which could contaminate storm water. The Storm Water Plan is in compliance with the Federal Clean Water Act, Guidance Document for Preparation of NPDES Storm Water Pollution Control Plan , and General Permit #1200Z. See question 52 for a discussion of this and other permits.

The site consists of approximately 80 acres (see response to Question 4 for further detail) of which approximately 1/3 is developed. The developed portion consists of several buildings and structures with a roof area of 392,300 square feet. Streets and parking lot paving covers an additional 588,600 square feet. General summary of the storm water controls include:

- All manufacturing activities occur inside buildings,
- All hazardous material storage occurs inside building, under cover within concrete bunkers or within paved and bermed secondary containment areas,
- Secondary containment for all chemical storage tanks,
- Chemical transport occurs only on paved surfaces,
- All bunker containment systems include blind sumps which are pumped or have drains connected directly to an onsite waste water treatment plant,

- Storm water is diverted from catch basins near bermed areas by closing a storm water control valve during hazardous material transfers,
- Sedimentation manhole and catch basins, some with isolation valves, control of solids and small amounts of oil,
- Oil/water separators at all transformer vaults,
- Proper storage of recyclables mostly under cover,
- Erosion control measures with plantings and catch basin covers or filters during construction activities,
- Semi-annual parking lot sweeping,
- Semi-annual catch basin cleanout, including oil/water separators
- Monitoring and sampling of storm water four times per year,
- Onsite Emergency Response Team to quickly address accidental spills
- Spill Response Procedures

Annual Storm Water Pollution Prevention Training

The stormwater drainage system is shown in MFA reports, included in the electronic submittal for this question. No septic tanks or systems were or are present.

13j. No subsurface disposal fields present. For information regarding UIC wells, please see document SDMS-1254117 (EIB Pilot Study Report). For information regarding former USTs, please refer to the Siltronic RI report (SMDS-1258448) and Use and Management of TCE Report (SCOEPA00017665 throughSCOEPA00017705) ().

13k. Siltronic's original excavation and construction activities were completed in 1978. The dates of all major additions, demolitions or changes on under or about the property are listed in the table below and the inserted image of drawing GRA-607B, Siltronic Construction History (SCOEPA00112444).

In addition, as part of the 1995 Fab 2 manufacturing building construction, a new stormwater drainage system was constructed to outfall 003. See drawing 1C89, Site Civil Storm Drain System Plan, (SCOEPA00112441),

	Major Additions, Demolitions or Changes
Date	**Description**
1978	Fab 1 Ground Breaking
1978	Fab 1 Manufacturing Building and Administration Building
1978	Fab 1 Waste Water Treatment Plant
1978	Central Utilities Building
1978	Fab 1 Acid Storage Building
1978 1995	Fab1 Warehouse Originally Located South of Fab 1 Warehouse Relocated To Southwest Property
1982	Fab 1 Polishing Expansion
1982	Process Technology Expansion
1984	Warehouse and Office Expansion

1984	Fab 1 Epitaxy Addition
1987	Fab 1 Epitaxy Expansion 1
1987	Central Facilities Building
1987	TCE Underground Storage Tank Removal
1990	Relocated Bulk Hydrogen Originally Located Next To Fab1 Epitaxy To Across The Service Yard
1990/1991	NOX Scrubber
1992	Installed Clean Dry Air (CDA) Filter In Existing Building
1992	Fab1 Underground CCD, CAD, & WAD Tanks Removed
1992/1993	Fab1 Wastewater Forwarding Sump
1992/1993	Fab1 Wastewater Treatment Plant Upgrade And Added Above Ground Pipe Containment To WWTP
1993	Fab 1 Final Cleaning Expansion
1994	Fab 1 Epitaxy Expansion 2
1994	Fab 2 Ground Breaking
1994	Central Facilities Building Expansion for Fab 2
1994	Wastewater Treatment Expansion for Fab 2
1995	New Detached Warehouse Building
1995	Relocate Detached Warehouse Building to SW corner of property
1995	Fab 2 Manufacturing Building
1995	Fab 2 Wastewater Forwarding Sump
1995	Fab 2 Bulk Acid Storage Area (HF/HNO3)
1996	Crystal Growing Warehouse Addition
1997	Fab 1 North Office Expansion
1997	Central Utilities Building Expansion
1997	Pad for Nitrogen Generation Plant
2001	Chromic Waste Storage
2001	Pad for Nitrous Oxide Bulk Supply
2002	New Bulk Hydrogen Pad To Replace Hydrogen In Service Yard
2007	TCE Stripper/Carbon Absorption Demolition
	Planned Changes
Date	**Description**
Fall 2008	Decommission and remove Chiller #1 and Chiller #2 (Fab 1)

13l. These are the primary drawings associated with the site.

- SCO drawing 1C1, Site Civil Site Plan (SCOEPA00112101)
- SCO drawing 1C107A, Site Civil Topographic of South Property (SCOEPA00112442)SCO drawing GRA-522, Overall Site Plan (SCOEPA00018425) .

Other site drawings and details are available from Siltronic's Engineering Documentation department on request.

13m. Please refer to SDMS-1258448. Additional photographs from Siltronic Historic Environmental files and from Executive files are being produced with this response

13n. i.-iii. Please refer to Conceptual Site Model – Site Summary in EPA SDMS-1210617 and as updated by the Lower Willamette Group (LWG) and submitted to EPA on 12/16/07. 13n. iv. New buildings built by Siltronic after the 1990s are also shown on drawing GRA-607B, Siltronic Construction History (SCOEPA00112444), as listed in the table below.

	Major Additions, Demolitions or Changes
Date	**Description**
2001	Chromic Waste Storage
2001	Pad for Nitrous Oxide Bulk Supply
2002	New Bulk Hydrogen Pad To Replace Hydrogen In Service Yard

13n. v. No settling ponds have been located on the property while under Siltronic ownership.

13n. vi. Siltronic excavations adjacent to the Koppers Company property line are shown on drawing GRA-607B (), Siltronic Construction History, as listed in the table below and identified in SCOEPA00112444.

	Major Additions, Demolitions or Changes
Date	**Description**
1978	Fab 1 Waste Water Treatment Plant
1978	Central Utilities Building
1992/1993	Fab1 Wastewater Treatment Plant Upgrade And Added Above Ground Pipe Containment To WWTP
1994	Wastewater Treatment Expansion for Fab 2
1995	Relocate Detached Warehouse Building to SW corner of property
1995	Fab 2 Manufacturing Building
1995	Fab 2 Wastewater Forwarding Sump
1995	Fab 2 Bulk Acid Storage Area (HF/HNO3)
2001	Pad for Nitrous Oxide Bulk Supply
2002	New Bulk Hydrogen Pad To Replace Hydrogen In Service Yard

In addition, the following excavations by others are known to have occurred within the current utility easement area:

- The City of Portland placed sewer and water mains in the 1970s prior to Siltronic's ownership.
- Olympic Oil abandoned old oil lines and placed new lines March 1991. Siltronic has photos of the excavation, which can be viewed upon request.
- Northwest Natural placed gas mains in utility easement in the 1970s prior to Siltronic's ownership..
- Northwest Natural inspected and repaired a gas isolation valve near Fab1 Backflow Preventer Building (2007).

- Northwest Natural inspected and repaired the gas main (2007).

14. For Properties adjacent to the Willamette River, provide specific information describing the river-ward boundary of private ownership and where state aquatic lands and/or state-management jurisdiction begins. Provide a map that delineates the river-ward boundary of each Property.

Response:

The Bargain and Sale Deed dated August 17, 1978, which conveyed ownership of the Property to Siltronic from the City of Portland acting by and through the Portland Development Commission as the duly designated Urban Renewal Agency of the City of Portland as described in Response to Question 7, describes in metes-and-bounds riverward conveyance "to the established United States Outer Harbor Line" but "SUBJECT to the rights of the public for fishing and navigation, the rights of the State of Oregon, the rights of the USA and other governmental bodies in and to that portion lying below the low water mark of the Willamette River."

Siltronic has provided a map showing the property boundary, which it obtained from the Metro-Regional Land Information System (RLIS). The boundary so derived has been used repeatedly for purposes of Siltronic's technical submittals to Oregon DEQ, including its Remedial Investigation Report. The riverward boundary on this map appears to coincide with the low water mark, as indicated in the August 17, 1978 Deed. That information, however, is subject to disagreement and potential dispute by the State of Oregon.

Oregon's Department of State Lands (DSL), in reliance on an Oregon Attorney General's Opinion, No. 8281 dated April 21, 2005, appears to assert the position that State ownership received in 1859 by virtue of its sovereignty as a state extends to all submerged and submersible lands including the "bed and banks below the ordinary high water mark," subject to certain exceptions that must be determined on a case-by-case basis. Moreover, such water mark boundaries were over time altered by "artificial creation of new lands or water surface through dredging and filling [that] created clouds on the title of the bed and banks of the Willamette River." See attached document: Department of State Lands – Environmental Remediation on State-Owner Lands.

Siltronic understands that DSL will provide in its response to the 104(e) information request, specific information describing the river-ward boundary for each riparian parcel and identifying where state-owned submerged and submersible lands begin.

Siltronic's riverward boundary pursuant to the deed description is delineated on the "Site Civil Site Plan", SCO drawing 1C1(SCOEPA00017713).

15. For each Property, provide all reports, information or data you have related to soil, water (ground and surface), or air quality and geology/hydrogeology at and about each Property. Provide copies of all documents containing such data and information, including both past and current aerial photographs as well as documents containing analysis or interpretation

of such data.

Response:

Circa 1978 geotechnical borings were conducted to determine the site suitability to support a structure at or about the time of purchase. At least one of these sample contained bitumen. In 1979 during construction of the wastewater treatment plant, a leak was discovered in the Olympic Pipeline in the south west corner of the site. Olympic Pipeline responded to repair the pipe and recover free product from the soil. No sample data has been discovered in the records. During 1984 after Wacker Siltronic announced plans to construct a poly-silicon plant on the site NW Natural Gas Company disclosed that PAH and MGP materials were present on the site. Siltronic reported this information to DEQ. During 1984-5 groundwater sampling wells were installed in response to Doane Lake investigations in the south west portion of the site. Groundwater and soil samples confirmed the presence of BTEX compounds and other organics.

In 1989 another set of geotechnical samples was taken to determine a building site for a second Fab. Higher levels of BTEX compounds were found near the area of the utility corridor. Additional sampling found the highest concentrations of BTEX compounds near the Olympic Pipeline. This information was provided to DEQ in the form of a Soil and Gas Report and to Olympic Pipeline officials. In March 1991 the Olympic Pipeline failed a pressure test in a portion of the pipeline crossing the Siltronic property. Two sections of approximately 2,000 feet each were replaced and the old pipe was abandon in place.

From December 1994 through the Spring of 1995 black soil with petroleum like odor was uncovered in several locations and isolated in visqueen lined roll-off boxes during excavation for utilities in support of a new Fab 2 building. Each roll-off box was sampled and analyzed and found to contain PAH and BTEX compounds. Later in the project a larger amount of PAH and tar-like soils were excavated from an area where a sump was to be installed. After approval from DEQ, all contaminated soils were thermally treated on-site and reanalyzed. All treated soils met all landfill standards and were sold as cover fill materials. A full soils treatment report and a closure report were filed with DEQ in conformance with the treatment approval letter. SCOEPA00037552 through SCOEPA00037603, SCOEPA00037514 through SCOEPA00037551.

In 2000, Siltronic received a joint order along with NW Natural to investigate PAH and hazardous material on the site. During this investigation TCE contamination was discovered and a second order to investigate TCE was issue in 2004 by DEQ. All subsequent studies and data have been submitted to DEQ. These reports also included all of the earlier data and history.

Copies of all reports not already in EPA's SDMS are included in the electronic production associated with this information request. Such environmental investigations, reports and data are included in responses to question in Section 7.0 Property Investigations (see response to Question 71). Aerial photographs are included within those reports, specifically Siltronic's RI Report. SCOEPA00105946 - SCOEPA00106087.

16. Identify all past and present solid waste management units or areas where materials are or were in the past managed, treated, or disposed (e.g., waste piles, landfills, surface

impoundments, waste lagoons, waste ponds or pits, tanks, container storage areas, etc.) on each Property. For each such unit or area, provide the following information:

a. a map showing the unit/area's boundaries and the location of all known units/areas whether currently in operation or not .This map should be drawn to scale, if possible, and clearly indicate the location and size of all past and present units/areas;
b. dated aerial photograph of the site showing each unit/area;
c. the type of unit/area (e.g., storage area, landfill, waste pile, etc.), and the dimensions of the unit/area;
d. the dates that the unit/area was in use;
e. the purpose and past usage (e.g., storage, spill containment, etc.);
f. the quantity and types of materials (hazardous substances and any other chemicals) located in each unit/area;
g. the construction (materials, composition), volume, size, dates of cleaning, and condition of each unit/area; and
h. include in your response all information requested above that applies to, but is not limited to, manufactured gas plant waste pits, tar settling ponds, or other disposal areas and the following wastes or materials:
    i. benzene;
    ii. bromine;
    iii. cadmium;
    iv. chromic acids;
    v. freon;
    vi. lab packs;
    vii. spent acids from etching; . .
    viii. tetramethylammonium hydroxide; and
    ix. TCE.

Response:

Prior to 1900, the property was essentially undisturbed lowlands. A portion of the property contained part of a small, shallow lake known as Doane Lake. The property was swampy and subject to flooding in the winter and spring. In 1908, the Astoria and Columbia River Railroad constructed a double track railroad bridge across Doane Lake and the Willamette River. No information is in Siltronic files about fill materials used to construct the railroad berm and the fill materials placed into the Doane Lake.

Western Transportation constructed a tug refueling dock at the eastern corner of the property that operated from the 1930's until at least 1940. A pipeline was constructed from east to west across the site (and later abandoned) between Western Transportation and Portland Gas and Coke to the west. There are no records of what materials were transported in the pipeline and there were no known solid waste management units associated with Western Transportation facilities.

Portland Gas and Coke (PG&C) operated an oil gasification facility to produce Manufactured Gas Products (MGP) on adjoining property from the early 1900's until 1956. Several Solid Waste

management units were created to manage waste products including multiple MGP waste disposal areas in the northwestern quadrant of the property.

PG&C's operations included direct disposal of liquid MGP waste into the Willamette River until approximately 1941, at which time two settling ponds (approximately 2.5 acres and 0.75 acres in size) were constructed near the eastern corner of the current Gasco facility property. The smaller of the two ponds was partly located on property later purchased by Siltronic. The amount of MGP waste discharged directly to the river is unknown.

Prior to 1951, the settling ponds were designed to overflow from the Gasco property to the Willamette River via a ditch located near the present Gasco/Siltronic property boundary. After 1951 an additional lagoon was added and the discharge was modified. MGP waste was discharged to the smaller settling ponds, which were designed to overflow into an approximately 11-acre lagoon; the lagoon in turn overflowed into a perimeter ditch that discharged to the Willamette River. MGP operations ceased in 1956, but the lagoon contained MGP waste until the mid-1960s.

According to DEQ, the ponds are thought to have contained at least 6 million gallons of liquid waste, including process water and MGP byproducts, and may have also contained as much as 3.9 million gallons of dry tar. To our knowledge, a more accurate assessment of the volume of waste contained in the lagoon has not been completed.

A waste pile existed on the southwestern portion of the site, which apparently contained lampblack and spent iron oxide materials from the MGP operation.

Following termination of MGP operations, the ponds were filled and the remaining MGP solid waste, including lampblack and spent oxide, was spread across the Siltronic property as evidenced by historical aerial photography. The lagoon was filled in approximately 1966. Waste materials from the GASCO Solid Waste Management Units were incorporated into fill materials between then and 1977. The fill consisted of former MGP process wastes, dredged material from Willamette River dredging operations, quarry rock and overburden, and potentially materials and wastes from other onsite and offsite sources. The initial fill estimate was 1,529,400 cubic yards. Port of Portland records indicate that 695,522 cubic yards of material dredged from the river were placed on the site (PDC, 1985). Waste from MGP operations is visible (in aerial photos) on the surface until site improvements in the 1970s.

In 1970, the Coast Guard took enforcement action against Northwest Natural due to an oil slick on the Willamette River originating from the 2.5 acre pond; the pond was filled by 1971 (DEQ, 1994).

A drainage ditch situated along the western and southern perimeter of the lagoon, as shown in aerial photos dated 1955, 1956 and 1964, appears to have drained the North Doane Lake area as well as the lagoon. North Doane Lake (NDL) received waste from off-site sources, including process waste and byproducts from the RPAC facility, as well as from the Koppers facility on the Northwest Natural property. In the 1955 photo, this lagoon perimeter ditch is shown to be discharging a dark plume directly to the river. The lagoon perimeter ditch continued to drain portions of the site impacted by MGP waste disposal until approximately 1969-1970. In circa 1960 a chemical spill occurred into North Doane Lake from either Chipman Chemical or RPAC

resulting in damage to trees and vegetation around the perimeter of the lake along the southeastern portion of the site. See question #11.

A drainage ditch from the southern corner of the Gasco site (which included Koppers' operations at that time) was constructed in approximately 1966 and connected to NDL. At approximately the same time, a ditch was constructed that connected NDL to the Willamette River (see note above regarding NDL's connection to RPAC). The NDL-Willamette River ditch drained NDL until about 1972, when a 96" outfall was installed to serve the same function. The 96" outfall and pipe leaked and were replaced in 1980 by the City of Portland with what is now known as Outfall 22C.

The southern portion of the site was mostly undeveloped until it too was filled to about 30 feet above MSL (current grade) between 1971 and 1977. The Willamette River dredge spoils described above and used in that fill operation may or may not have included sediments impacted by direct discharge of MGP wastes from the PG&C facility (PDC, 1985). Wastes from MGP operations remain in the subsurface to date and are presumed to have included tar, oil, oil tar, spent oxides and other process residues related to oil gasification. MGP residues detected on the site include PAHs, Naphthalene, Benzene and BTEX compounds,

Wacker Siltronic Corporation purchased the property from the City of Portland, acting through the Portland Development Commission, in 1977 and began construction of a silicon wafer manufacturing facility in 1978. Support facilities for the wafer fabrication plant included a variety of waste holding, storage and treatment units.

Wafer manufacturing operations included the use of Freon, TCE, chromic acid, nitric and hydrofluoric acids, and ammonium hydroxide.

Freon was stored in stainless steel tank within secondary containment systems and used in wafer cleaning processes as a dewatering agent. Waste Freon was shipped off-site for recycling in DOT closed head drums. At one point an onsite Freon dryer was purchased to remove contained water. The Freon dryer was located inside the building and consisted of a recirculation tank, 50 GPD still, and a molecular sieve to remove residual water after distillation. By 1993 all use of Freon was discontinued except for closed loop chiller systems. Freon tanks were removed after elimination of all uses of Freon 113, TE, TP, and TMC

TCE was used as an ingredient in wax. The wax attached wafers to polishing plates for processing. TCE was also used to clean residual wax off the polishing plates prior to reuse. Waste TCE was collected in an underground tank which was then recycled off-site. Rinse water from wafer cleaning and polishing plate cleaning operations contained small amounts of TCE. The TCE containing rinse water was also collected in an underground tank. The rinse water from this tank was treated onsite in a large distillation column to remove the TCE and residual wax. The treated water was discharged to the local POTW under an NPDES permit issued by Portland BES and the still bottoms were containerized and shipped offsite as hazardous waste. The underground tanks were replaced by an above ground tank system with secondary containment in 1983. The tanks were removed from the ground in 1987. The above ground solvent organic drain (SOD) system has been decommissioned and remains empty. See SCOEPA00112687.

TCE waste management units operated from 1980 until approximately1989 when the last of

the TCE solvent was removed from the manufacturing processes. TCE use decreased significantly during 1985-6 when a water based wax formulation was developed and introduced to the wax mounting process. TCE waste minimization projects reduced use in plate preparation and wax mounting in 1986. TCE was eliminated in 1989. See the attached memorandum at (SCOEPA00037884).

The TCE Stripper operated until approximately 1992 until the last Freon dryer was replaced by spin dryers and Freon was eliminated from process areas.

Chromic acid was used in a testing laboratory to identify and delineate silicon crystal defects. Waste chromic acid and rinse water containing chromic acid were collected in a double wall piping system and sent to an isolated above ground tank system with secondary containment. From 1980 to 1985 Chromic acid solutions were shipped offsite by tanker truck for treatment and stabilization as a hazardous waste to a TSDF at Chemical Waste Management. In 1985, the chromic acid collection tank was replaced by a chromic acid treatment system inside the existing secondary containment system. The onsite treatment system resulted in a 98% reduction in volume and toxicity of the chromic acid waste stream by converting liquid chromic acid wastewater to chromium hydroxide solid and shipment to a TSDF as a solid hazardous waste. Continuous waste reduction activities reduced the volume of chromic acid waste generated until it was no longer economical to treat the chromic wastewater onsite and the treatment system was replaced by an automatic tote fill station in 1999 and again sent offsite for treatment. The chromic acid treatment system was decontaminated disposed. Only the decommissioned chromic acid building remains onsite. Current operations still include chromic acid waste with 99.9% reduction.

Nitric Acid and Hydrofluoric Acids are used in wafer etching operations. HNO3 and HF wastewater are treated onsite in a wastewater treatment system. Treatment consists of gravity drains from the process areas through double wall piping to forwarding sumps and on to the WWTP. Treatment consists of fluoride precipitation with calcium hydroxide, settling, and dewatering. Nitric acid is neutralized to meet effluent requirements and discharged to the Willamette River under an NPDES permit issued by DEQ. The treatment sludge is disposed as a solid waste under a Special Waste Permit.

Ammonium hydroxide was used in wafer cleaning along with surfactants in an aqueous based cleaning system for wafers between 1980 and the early 1990s when the ammonium hydroxide was replaced by tetra-methyl ammonium hydroxide (TMAH). The NH4OH/TMAH wastewater is collected in a separate drain system and neutralized at the WWTP to meet effluent standards and discharged to the local POTW under an NPDES permit issued by the Portland BES.

Other manufacturing chemicals that cannot be treated onsite are containerized, characterized, profiled, and manifested for shipment off-site for treatment and disposal. No solid waste management units exist for lab packs or other chemicals. Occasionally an individual chemical can be treated at the onsite WWTP or meets discharge requirements for discharge to the POTW. In these cases a request is made to the governing authority to add a waste to the existing treatment system and discharge.

Construction activities in 1978 and 1991 discovered oil leaks from the Olympic pipelines in two different areas. Both leaks were reported to Olympic Pipeline. Olympic responded by replacing sections of the failed pipes across portions of the property. In 1978 a pipeline leak was discovered during construction of the Siltronic WWTP. Olympic pipeline responded and excavated a damaged section of pipe in the southwestern portion of the site. An oil/water separation pit was excavated along the southern property boundary and oil and groundwater was pumped into this new pit for separation. The oil was recovered from the pit into tanker trucks and taken offsite for recovery. The remaining groundwater and oil contaminated soils were pushed back into the excavations and left onsite. In 1990 a soil sampling project for construction of Fab 2 discovered high BTEX contamination in soils. The highest concentration was centered over the utility corridor above the Olympic pipelines. Olympic responded but did not agree that their pipe was leaking. In 1991 Olympic notified Siltronic that one of their pipes failed a pressure test and they needed to repair the pipe. Olympic abandon in-place the two existing pipelines running east-west and replaced approximately 2,000 feet of each pipeline. Heavy oil was observed on top of groundwater that accumulated in the bottom of the excavations. Olympic maintained that the oil was not from their pipeline.

Construction activities in 1991 and 1994-95 encountered MGP contaminated soils. In 1991 during construction of a replacement forwarding sump for Fab 1, construction was stopped and the contaminated soil containerized and manifested for off-site disposal as hazardous waste to a TSDF. In 1994-5, during construction of Fab 2, MGP contaminated soils were encountered during excavation for stormwater system, elevator shafts, fire water containment tanks, water and electrical trenches, and the Fab 2 wastewater treatment forwarding sump. All of the soils except for the forwarding sump were containerized in lined drop boxes, characterized, and determined to be hazardous for LDR benzene and exceeded Oregon landfill standards for TPH.

DEQ granted a solid waste letter of authorization to conduct onsite treatment of the soils. A solid waste management unit was created to treat the MGP by thermal desorption and thermal oxidation. Each treated batch was analyzed and sold as top soil for landfill cover material after meeting all treatment requirements. A complete treatment and closure report was submitted to DEQ after completion and closure of the temporary SWMU. See SCOEPA00037906, SCOEPA00037552-SCOEPA00037603, SCOEPA00037514-SCOEPA00037551.

Potential and actual Solid Waste Management Units include:

- Western Transportation Pipeline (Supplemental Fig. 2-2, Map Location A) (SCOEPA00105779) –This pipeline presumably operated during the operational life of Western Transportation (at least into the 1940s), and may have been abandoned during filling activities. The pipeline contents are unknown.

- Former Western Transportation Tanks (Fig. 2-2 Map Location B) (SCOEPA00105779)– Petroleum products were stored in aboveground tanks near the fueling dock. No known releases.

- PG&C Waste Disposal Lagoon and Effluent Settling Ponds (Fig. 2-3, Map Locations D and F) (SCOEPA00105780)– This area includes unlined ponds on the Gasco facility bordering the northwestern edge of the current Siltronic property and an 11-acre waste

disposal lagoon that received overflow or discharges from the ponds. The ponds were in operation from about 1941 to 1956, and remained in place until 1967. The lagoon was filled by 1971. During operation, the ponds and lagoon received MGP wastes, composed mostly of SVOCs, PAHs and aromatic VOCs (BTEX).

- PG&C Waste Disposal Pile (Fig. 2-3, Map Location E) (SCOEPA00105780) – Solid MGP waste products were stored (uncovered, with no containment) in this area until about 1956. The disposition of this material is unknown but some portion of the waste was presumably used to fill portions of the Siltronic property.

- PG&C Disposal Piles (Fig. 2-3, Map Location G) (SCOEPA00105780)– Solid MGP waste was stored (uncovered, with no containment) in the southwestern corner of the Siltronic property.

- PG&C Waste Disposal Pit (Supplemental Fig. 2-3, Map Location H) (SCOEPA00105780)– This small (approximately 2-acre) pond received MGP waste including tar through approximately 1963 (HAI, 2005).

- PG&C MGP Waste Disposal Lagoon Discharge and Creek Discharge (Fig. 2-3, Map Location I) (SCOEPA00105780) – This ditch discharged MGP waste from the Lagoon and elsewhere to the Willamette River from approximately 1951 through 1961. The ditch continued to drain other portions of the Siltronic property (including NDL, which was impacted by RPAC operations) until about 1967.

- PG&C Waste Disposal Pile (Fig.2- 4, Map Location J) (SCOEPA00105781)– Solid MGP waste products were stored (uncovered, with no containment) in this area until about 1970. The disposition of this material is unknown but some portion of the waste was presumably used to fill portions of the Siltronic property.

- Olympic Pipeline (Fig. 2-4, Map Location K) (SCOEPA00105781)– Multiple leaks of petroleum products have been documented. The pipelines are known to have conveyed gasoline, diesel, and kerosene fuels. However, the site data indicate that potential releases were limited to the area immediately adjacent to the pipeline, and that the pipeline is not a source of impacts to the Willamette River.

- PG&C/Koppers Drainage Ditch (Fig. 2-4, Map Location L) (SCOEPA00105781)- Koppers Company leased an eight-acre portion of the PG&C site in 1965 and built a tar distillation plant. Products included pencil pitch and synthetic petroleum fuels. Waste streams of creosote and pitch were cooled and solidified in storage tanks. The plant shut down in 1973 and has only been used for the bulk transfer of creosote oil, refined tar and tar pitch since 1977. A drainage ditch was installed along the western and southern perimeter of the Siltronic site and historically drained to NDL. Later, this ditch drained to the North Drainage Pond (NDP, map location M) and the Willamette River via the 96" CMP outfall (map Location N). Leaks were discovered in the 96" CMP pipe and it was replaced by the City in approximately 1980 with an 84" concrete drainage pipe and a

constructed outfall. Today, the NDP drains via City of Portland Stormwater Outfall 22C (map Location O).

- Kinder Morgan Pumping Station (Fig. 2-4, Map Location P) (SCOEPA00105781) Methyl-tert-butyl-ether was discovered in deep AWBZ and CRB groundwater during the initial TCE investigation. The pumping station is a likely potential source of the MTBE.

- Rhone-Poulenc AG Company (Fig. 2-4, RPAC, Map Location Q) (SCOEPA00105781) Mono- and dichlorobenzenes and silvex (an organochlorine pesticide) were detected in groundwater during the TCE investigation. The RPAC facility is a likely source for these compounds. Diesel fuel (a pesticide carrier) was also released during RPAC operations. TCE is a COI at the RPAC facility; TCE was detected in deeper groundwater samples associated with the detections of silvex.

- PG&C Waste Product Fill (Fig. 2-4, Map Location R) (SCOEPA00105781)– Solid MGP waste was incorporated into the site fill throughout the site, based on aerial photo review. MGP-related waste impacts have been observed in the soil near the NDP.

- Former TCE USTs (WS-13, Figure 3-3) (SCOEPA00105789)– TCE was stored in USTs from 1980 to 1983. A release or releases of an undetermined amount of TCE from the UST system occurred during that time frame. TCE was released to groundwater.

- Former TCE recycling system (approximately 90 feet east of WS-13, Figure 2-5) (SCOEPA00105782). A TCE release from the recycling system occurred in 1984. It appears that some of the TCE reached the stormwater system (and subsequently Willamette River sediments) via the combined NPDES/stormwater outfall.

The Figures cited above were appended to the April 16, 2007 Remedial Investigation Report for Siltronic Corporation. SCOEPA00105946-SCOEPA00106087.

Additional information about Wacker Siltronic operations and waste management units are described in relevant reports in the EPA database, including but not limited to the following documents:

Date	Title	SDMS Document ID
6/19/1985	History of the Doane's Lake Industrial Area (Wacker Siltronic Site).	1187513
4/20/1994	Summary of Available Information: Northwest Natural Gas, North Doane Lake.	1187515
10/17/1994	Site Inspection Prioritization (SIP) Report for Koppers Company, Inc. Site.	1187516
3/28/1997	Environmental Cleanup Site Information Site Summary Report.	1079289

10/9/1998	Phase I Remedial Investigation Summary Report and Preliminary Analysis of Soil Data, Vol. 1.	1185309
10/9/1998	Phase I Remedial Investigation Summary Report and Preliminary Analysis of Soil Data, Vol. I: Gasco Facility.	1187519
2/17/1999	Phase II Remedial Investigation Data Package and Progress Report for Fourth Quarter 1998 RI/FS Activities: Gasco Facility.	1187521
7/28/2005	Comments on Report on Supplemental Upland Remedial Investigation Activities. NW Natural - GASCO Facility.	1225764
11/7/2005	CD ROM: Summary Report--Former MGP Operations & Dense Non-Aqueous Phase Liquid Occurrence, NW Natural Gasco Property & Siltronic Corporation Property.	1223924
5/26/2006	Letter transmitting DEQ Comments on the Summary Report-Former MGP Operations and Dense Non-Aqueous Liquid Occurrence, Northwest Natural and Siltronic Properties ECSI #84.	1244352
4/30/2007	Draft Portland Harbor Remedial Investigation/Feasibility Study (RI/FS) Conceptual Site Model Update Volume II.	1210617

Environmental records were reviewed and located a 1988 table of hazardous materials storage and locations within FAB1 (SCOEPA00037885 through SCOEPA00037886). Current hazardous material storage is identified in section 7 of the Storm Water Pollution Control Plan, Doc. No. P-27.10.02/0007. The current HM tables are attached and include information about waste water treatment tanks and secondary containment systems. See SCOEPA00112688-SCOEPA00112692.

Records of construction are incomplete for obsolete tank storage systems removed service. As a general rule all secondary containment structures for above ground tanks were concrete. Secondary containment structures for waste water treatment tanks, waste water forwarding sumps, former SOD tanks, former chromic acid storage and treatment tanks, and bulk acid storage tanks were lined with chemical resistant coatings. In addition FAB1 bulk acid storage tanks have a redundant system. These tanks sit in a plastic containment system inside the chemically coated concrete containment system for purposes of directing a spill or leak to the CAD treatment system and out of the bulk acid storage area. Wastewater tanks are FRP. CAD tanks are HDPE lined FRP tanks. Records suggest TCE tanks were carbon steel. Employee interviewed recalled Freon tank construction was stainless steel. Decommissioned SOD-T, SOD-C, and SOD-R tanks are stainless steel and SOD-H tank is mild steel. Decommissioned chromic acid treatment tanks were polyethylene. Bulk acid tanks are lined FRP.

17. If the unit/area described above is no longer in use, how was such unit/area closed and what actions were taken to prevent or address potential or actual releases of waste constituents from the unit/area.

Response:

Closure of Gasco units occurred prior to Siltronic's ownership of the property as discussed in the documents attached for Response 16.

No other information regarding closure activities for the Gasco units is available to Siltronic.

The following describes actions taken to prevent or address potential or actual releases of waste constituents.

Construction of the combined NPDES/stormwater outfall pipe included installation of cofferdams (in the form of concrete collars) to prevent migration of MGP-related constituents and oil from an Olympic pipeline along the pipe trench backfill. One cofferdam was located near the WWTP, where MGP waste and oil from an Olympic pipeline was discovered in an excavation for a clarifier, while the other was located adjacent to the Willamette River. During construction of the combined outfall (in 1979), oil booms were deployed in the Willamette River to limit surface water impacts from sheens created by MGP-related impacts in soil contacting the river water.

Design of drain systems, wastewater treatment systems and chemical storage systems were provided with secondary containment to prevent potential releases for Siltronic operations. Secondary containment was part of engineering design standards for new or modified processed or facilities improvement.

The design and construction of the Fab 2 anticipated the presence of the MGP waste in the soil. A contaminated soils management plan was developed to provide guidance to excavation contractors and construction activities. All excavation contractors were required to have Hazardous Waste Operations training (HAZWOPER) before working on the site. Each planned excavation was reviewed and designed to minimize the amount of soil that would be disturbed. The building design was modified to eliminate the basement area and to build the Fab on grade. Building redesign efforts created significant cost increases and triggered new permitting requirements and building height limitations for a three story building within a green space rather than a two story building with a basement.

Stormwater drain systems were engineered to minimize slope and made as shallow as possible. The number of elevator shafts were restricted to two hydraulic units to minimize depth and volume of shaft excavations. Process drain systems were designed with full secondary containment provided by shallow trenches built into the subfab floor. Leak detection systems monitored process drains continuously. Process water systems were designed as gravity drain systems to minimize the need to multiple transfer pumps and the potential for pump leaks or failures. All process wastewater drained through secondary containment trenches to a wastewater forwarding sump external to the building shell. The forwarding sump created the largest potential to contact MGP wastes and contaminated soils.

The contaminated soils management plan required an observer for all excavation activity. Empty roll-off containers with plastic liners were staged on the site in case MGP contaminated soils were

encountered. Potentially contaminated soils were identified by odor, color, or the presence of petroleum-like characteristics based on limited previous experience from construction projects on the site. When potentially contaminated soils were observed the work stopped. A roll-off container was moved to the location and potentially contaminated soils were isolated, containerized, covered, and sampled. Analysis was shared with DEQ. More than 50 roll-off boxes were filled with visually impacted soils. Four or five of the boxes failed TCLP or LDR quantities (primarily failed for benzene) and required treatment or special disposal arrangements. Failed boxes were retested to verify results. Waste profiles were created with hazardous waste landfills for potential disposal options and discussion was initiated with DEQ about onsite treatment options. DEQ issued a Solid Waste Treatment Letter of Authorization to Siltronic which allowed onsite treatment of the MGP impacted soils by the use of thermal desorption followed by thermal oxidation of the volatilized gasses. The authorization letter set analytical requirements and performance standards for the treated soils. Siltronic agreed to treat soils contained in the roll-off boxes even if they currently met State standards for landfill and newly excavated soils from the wastewater forwarding sump project.
Portable thermal oxidation equipment was mobilized to the site first to treat soils contained in the covered roll-off boxes and a second time to treat soils from the wastewater forwarding sump excavation. After treatment each batch of soils were again tested and found to meet all standards set by the State. Treated soils were sold and recycled as landfill cover.

A Treatment Report with analysis of roll-off boxes and final analysis of treated soils was submitted to DEQ and included in the responsive documents (SCOEPA00037552 through SCOEPA00037603).

Closure of the temporary soil treatment unit employed during construction of Fab 2 is described in the Closure Report (SCOEPA00037514 through SCOEPA00037551), included in the responsive documents.

Siltronic has also received numerous awards for taking voluntary action to reduce its impact on the environment, including awards for reducing its use and emissions of toxics and thereby reducing the potential for releases to the environment. Information on these awards is included in the documents responsive to this request.

18. For each Property, provide the following information regarding any current or former sewer or storm sewer lines or combined sanitary/storm sewer lines, drains, ditches, or tributaries discharging into the Willamette River:

    a. the location and nature of each sewer line, drain, ditch, or tributary;
    b. the date of construction of each sewer line, drain, ditch, or tributary;
    c. whether each sewer line, or drain was ever connected to a main trunk line;
    d. whether each sewer line, drain, ditch, or tributary drained any hazardous substance, waste, material or other process residue to the Willamette River; and
    e. any documentation regarding but not limited to the following on any and all outfalls to the Willamette River which are located within the boundaries of the Property(ies). Your response should include, but not Be limited to:
        i. the areas serviced by the outfalls; and

ii. the type of outfall (i.e., storm water or single facility operational).

Response:

Current Outfalls (1978-present)

Siltronic has three outfalls that discharge to the Willamette River on Siltronic property and one that connects to a City of Portland Storm Water line which discharges to the Willamette River East of Siltronic property. There are no ditches or tributaries that discharge from Siltronic property. Detailed information in response to question 18 sub-parts a., b., c., d., and e. ii. are provided in the table below. The location of each outfall and the areas serviced by each outfall are detailed in Siltronic drawing 1C89, Site Civil Storm Drain System (SCOEPA00112695), and Siltronic drawing 1C89B, Site Civil Drain Basin Plan (SCOEPA00112696). Ground covering in the serviced areas is detailed in Siltronic drawing 1C109, Site Civil Ground Covering Plan (SCOEPA00112697). Similar information is available in the Conceptual Site Model Site Summary provided in SDMS-1210617 and as updated in the Round 2 Report.

Siltronic policies and requirements for storm water pollution prevention and control are detailed in the "Stormwater Pollution Control Plan", Siltronic document number P-27.10.02/0007, SCOEPA00112453-SCOEPA00112485

All stormwater discharge is under 1200 Z permit, and all treated waste water discharge is under NPDES permit.

	Conveyance	Effluent Type	Date of Construction	Ever Connected to Main Trunk Line	Hazardous Substances, Waste, or Process Residue
Storm Water Outfall 001	Gravity Pipe	Combined Effluent (1)	1978	N	Y (1)
Storm Water Outfall 002	Gravity Pipe	Storm Water	1978	N	N
Storm Water Outfall 003	Gravity Pipe	Storm Water	1995	N	N
Strom Water Outfall 004	Gravity Pipe	Storm Water	1978	N	N
City of Portland	Gravity Pipe	Storm Water	1978	Y, current	N

Notes:

(1) Combined effluent includes the following:
- Storm water, under 1200 Z permit
- Treated waste water from SCO Waste Water Treatment Plant, under NPDES permit
- Non-contact cooling water
- Cooling tower blowdown
- Backwash from ultra-pure water (UPW) filters

Historical Outfalls and Ditches (prior to 1978 Siltronic Acquisition/Ownership)

Northwest Natural's historic operations included direct disposal of liquid MGP waste to the Willamette River until approximately 1941, at which time two settling ponds (approximately 2.5 acres and 0.75 acres in size) were constructed near the eastern corner of the current Gasco facility property. The smaller of the two ponds was partly located on property later purchased by Siltronic. The amount of MGP waste discharged directly to the river is unknown.

Prior to 1951, the settling ponds were designed to overflow from the Gasco property to the Willamette River via a ditch located near the present Gasco/Siltronic property boundary. After 1951 an additional lagoon was added and the discharge was modified. MGP waste was discharged to the smaller settling ponds, which were designed to overflow into an approximately 11-acre lagoon; the lagoon in turn overflowed into a perimeter ditch that discharged to the Willamette River. MGP operations ceased in 1956, but the lagoon contained MGP waste until the mid-1960s. The ponds are thought to have contained at least 6 million gallons of liquid waste, including process water and MGP byproducts, and may have also contained as much as 3.9 million gallons of dry tar (DEQ, 1994). To our knowledge, a more accurate assessment of the volume of waste contained in the lagoon has not been completed. Following termination of MGP operations, the ponds were filled and the remaining MGP solid waste, including lampblack and spent oxide, was spread across the Siltronic property as evidenced by historical aerial photograph. The lagoon was filled in approximately 1966. In 1970, the Coast Guard took enforcement action against Northwest Natural due to an oil slick on the Willamette River originating from the 2.5 acre pond; the pond was filled by 1971 (DEQ, 1994).

A drainage ditch situated along the western and southern perimeter of the lagoon, as shown in aerial photos dated 1955, 1956 and 1964, appears to have drained the North Doane Lake area as well as the lagoon. As noted elsewhere in the Conceptual Site Model Site Summary, North Doane Lake (NDL) received waste from off-site sources, including process waste and byproducts from the RPAC facility, as well as from the Koppers facility on the Northwest Natural property. In the 1955 photo, this lagoon perimeter ditch is shown to be discharging a dark plume directly to the river. The photographic evidence indicates a potentially complete pathway between upland sources (i.e., the PG&C ponds, PG&C or Koppers waste water, and RPAC via NDL) and the Willamette River sediments.. The lagoon perimeter ditch continued to drain portions of the site impacted by MGP waste disposal until approximately 1969-1970.

A drainage ditch from the southern corner of the Gasco site (which included Koppers' operations at this time) was constructed in approximately 1966 and connected to NDL. At approximately the same time, a ditch was constructed that connected NDL to the Willamette River (see above regarding NDL's connection to RPAC). The NDL-Willamette River ditch drained NDL until about 1972, when a 96" outfall was installed to serve the same function. The 96" outfall and pipe were replaced due to failure and leakage in 1980 by the City of Portland, when Outfall 22C was constructed along a similar alignment. The 1966-1972 drainage ditch, 96" outfall, and Outfall 22C are all potentially or reasonably complete direct discharge pathways for stormwater, MGP-related, and RPAC-related COIs to the river. The completeness of the Outfall 22C pathway for MGP-related and other impacts will be evaluated in the future.

Potential releases through this outfall are discussed in greater detail in the response to Question 62. Permit exceedances are discussed in Question 51.

19. Provide copies of any stormwater or property drainage studies, including data from sampling, conducted at these Properties on stormwater, sheet flow, or surface water runoff. Also provide copies of any Stormwater Pollution Prevention or Maintenance Plans or Spill Plans developed for different operations during the Respondent's operation of each Property.

Response:

Please see Spill Prevention Control & Countermeasures Plan, P-27.10.02/0003, Storm Water Pollution Prevention Plan, P-2710.02/0007, Annual Stormwater Reports) (,SCOEPA00112895-SCOEPA00112920, SCOEPA00112453-SCOEPA00112485) and Catch Basin and Stormwater Sampling Report, MFA 2007) (SCOEPA00039662 through SCOEPA00039663 and SCOEPA00039664 through SCOEPA00039693) , included in the responsive documents, in addition to the CSM Site Summary provided in SDMS-1210617 and as updated in the Round 2 Report. See also the "Fab 2 Site Finish Grade Plan," SCO drawing 1C36 (SCOEPA00112800-SCOEPA00112801). In addition, Northwest Natural conducted some stormwater catch basin sampling activities in 2001, pursuant to its Focused Remedial Investigation (RI) Work Plan for the Siltronic property. See SCOEPA00070614-SCOEPA00070646, SCOEPA00039097-SCOEPA00039130.

The topography of the geographic region surrounding Siltronic property is available from the USGS Linton Oregon 7.5-Minute Quadrangle, USGS No. 45122-E7-TF-024. The topography of the undeveloped portion of Siltronic property, lying to the south of Fab 2 and east of Siltronic's Waste Water Treatment, is shown on the "Site Civil Topographic of South Property 1998, With TOPO Lines", SCO drawing 1C107A (SCOEPA00112803). Siltronic site surface water runoff occurs within eight drainage basins, which are shown in the "Site Civil Drain Basin Plan", SCO drawing 1C89B (SCOEPA00112802); these eight drainage basins are summarized in the table below. Storm water outfalls are shown on the "Site Civil Storm Drain System Plan, SCO drawing 1C89 (SCOEPA00112695).

All stormwater discharge is under 1200 Z permit
Siltronic policies and requirements for storm water pollution prevention and control are detailed in the "Storm Water Pollution Control Plan", Siltronic document number P-27.10.02/0007 SCOEPA00112453-SCOEPA00112485.

Stormwater discharge is permitted under NPDES General Permit 1200-Z.. Copies of this and other permits are produced in response to Question 52. Data collected pursuant to this permit are reported annually to The City of Portland and/or Oregon DEQ (see Annual Stormwater Reports). In addition, data from a storm-line cleanout performed during October, 2007, was transmitted to Oregon DEQ and is included in the responsive documents..

The above-referenced Stormwater Pollution Prevention Plan details best management practices for

the site. Examples of these systems include:

- storage of chemicals inside process buildings or under covered chemical storage areas,
- paved chemical transport areas,
- a sedimentation manhole and catch basins, some with isolation valves,
- secondary containment of chemical storage tanks,
- oil-water separators,
- proper storage, disposal and recycling of wastes,
- erosion control measures,
- manufacturing conducted indoors,
- maintenance of parking areas, oil-water separators, and catch basins,
- monitoring, inspecting, sampling, and testing of stormwater discharges,
- an on-site Emergency Response Team to quickly address accidental chemical spills,
- plant security personnel to inspect the plant site daily for general operational problems,
- procedures for spill prevention and response,
- training on stormwater pollution prevention, and
- other measures such as catch basin filters and covers, as needed.

Hazardous materials are stored under cover, within berms or other secondary containment devices to prevent leaks and spills from contaminating stormwater.

All materials are stored in a controlled environment to prevent leaks and spills from contaminating stormwater. Source controls consist of some or all of the following:

- complete enclosure such as a building, covering, or roofing
- secondary containment in the form of curbing, sumps, or vaults
- oil-water separators to be inspected on a monthly basis
- annual PM to clean oil-water separators as needed
- semi-annual PM's to clean all catch basins
- annual PM to inspect outfalls for blockages and remove obstructions as needed
- emergency isolation valves to be used in the event of a chemical spill.

The majority of waste produced at Siltronic, are wastewaters that are collected in dedicated indoor isolated drain systems where there is no exposure to stormwater. These drain systems are treated at an onsite wastewater treatment plant. The correct operation of the drain system is critical to the operation of the WWTP and to meet the permitted discharge limits of regulating agencies.

Siltronic policies and requirements for spill prevention and counter measures are detailed in the Siltronic "Spill Prevention & Countermeasures (SPCC) Plan", Siltronic document number P-27.10.02/0003, SCOEPA00112895-SCOEPA00112920. Additionally, Siltronic's management and organized response to spills and releases are included in the "Emergency Preparedness, Prevention and Contingency Plan", Siltronic document number P-27.10/0001, SCOEPA00112804-

SCOEPA00112894. Siltronic maintains a trained Emergency Response Team that is trained to respond to and clean up spills. All Siltronic Employees receive annual training concerning emergency response, including response to spills.

The following table summarizes the drainage basin information for the site.

Drainage Basin (see DB Plan)	**Area in square feet**				**Outfall**
	Roof	**Pervious**	**Impervious**	**Total**	
DB 1	54,800	n/a	n/a	54,800	Stormwater Outfall 002 to Willamette River. This consists of a covered walkway that extends from the administration building to the FAB 1 entry and drains directly to the river. There is no industrial activity associated with this area.
DB 2	n/a	49,700	59,600	109,300	City Stormwater Outfall to Willamette River. No industrial activity associated with this area.
DB 3	198,000	291,000	383,200	872,200	Stormwater Outfall 001 to Willamette River. Stormwater from the Fab 1 parking lots, roof drains, and yard area. Transportation, chemical delivery, animals, and trees could be a potential source of TSS, O/G, pH, and metals.
DB 4	107,300	68,800	69,400	245,500	Stormwater Outfall 003 to Willamette River. Consists of stormwater from the Fab 2 parking lots, roof drains, and yard area. Transportation, chemical delivery, animals, and

Drainage Basin (see DB Plan)	Area in square feet				Outfall
	Roof	**Pervious**	**Impervious**	**Total**	
					trees could be a potential source of TSS, O/G, pH, and metals.
DB 5	5,500	30,500	76,400	112,400	To Siltronic's OWW waste system then to City POTW
DB 6	26,700	501,400	n/a	528,100	To ground and Willamette River (Administration building two small rear roof rain drains go to Stormwater Outfall 004) Not a source of industrial activity
DB 7	n/a	381,100	n/a	381,100	Ground infiltration. Not a source of industrial activity
DB 8	n/a	1,093,000	n/a	1,093,000	Ground infiltration. Not a source of industrial activity
Total	**392,300**	**2,415,500**	**588,600**	**3,396,400**	

Section 4.0 Respondent's Operational Activities

20. Describe the nature of your operations or business activities at each Property. If the operation or business activity changed over time, please identify each separate operation or activity, the dates when each operation or activity was started and, if applicable, ceased.

Response:

For detailed responses to operations conducted at the property please refer to questions 30 and 31.

Wacker Siltronic Corporation started operations in 1980 at 7200 NW Front Avenue, Portland, Oregon. Wacker Siltronic manufactures hyper-pure silicon wafers. Operations consist of crystal growing, ingot shaping, slicing, lapping, edge rounding, polishing, cleaning, and epitaxial

operations. Startup facilities included a single wafer fabrication facility known as FAB1 and several support facilities. Support buildings provide services for storage of chemicals and gases external to the process building, de-ionized water production, natural gas fired boilers for HVAC and heat exchangers, compressed air equipment, waste water treatment, emergency generators, and office space.

Wafer manufacturing technology at the time of original startup of operations in 1980 consisted of 75mm and 100mm wafers. The Portland operations produced 100mm and 125mm diameter wafers and soon moved to 150mm wafer technology by the mid-1980s and 200mm by the late 1980s. Startup technology in 1980 included crystal growing where hyper-pure poly-silicon imported from Germany is melted in a quartz crucible inside an electric induction furnace. Once melted, a mono-crystalline seed crystal is lowered into the furnace and dipped into the molten silicon. The seed crystal is slowly rotated as it is raised and the liquid silicon begins to freeze around the seed crystal. This is known as crystal pulling. The lengths of the completed crystals are from one to two meters long. Completed crystals are machined to a uniform diameter and cropped or cut into various lengths for slicing. No waste materials were purchased or processed in the crystal growing operation.

In 2004 crystal growing operations were shut down and the equipment removed. All silicon ingot is currently imported from Germany or purchased.

Ingot slicing was part of the original operations in 1980 and was significantly changed in 1995 and 1996 with the introduction of new technology. Ingot slicing is a step where the ingot is cut into slices by a diamond saw, one slice at a time. A silicon ingot was mounted with epoxy onto a graphite bar and secured into a diamond saw for slicing. Water and a surfactant were used as a lubricant and for cooling the sawing operation.

In 1995, new slicing technology was introduced where an entire ingot could be sliced at one time with the use of thin wires wetted by a silicon carbide (SiC) slurry. Once perfected, most of the diamond saws were removed and replaced by multi-wire saws.

Multi Wire Saw (MWS) slurry composition and volume has changed over time. The original process (developed in Germany prior to 1995) required the use of mineral oil as the suspension agent for the silicon carbide to make up the slurry. Removal of the oily slurry from the sliced silicon wafers required the use of solvents like mineral spirits. Adoption of the same technology in Portland would have created large amounts of oily liquid wastes, contaminated solvent and VOC emissions. Normally these types of waste would be incinerated. The US has limited incineration capacity. Using EPA recommended Design for the Environment (DfE) strategy, Siltronic research and development efforts in Portland developed and tested a glycol based slurry formulation with aqueous based cleaning systems that replaced the mineral oil and solvent technology. No mineral oil slurry was used in Portland or oily wastes produced. With the development of environmentally sound alternative technology, FAB1 was converted to nearly all MWS slicing in 1995 and 1996. In 1996 a second wafer manufacturing Fab, known as FAB2, was commissioned and based entirely on MWS slicing. In 1997 the MWS technology was transferred to other operations in Germany and later into Singapore. Today MWS technology is the standard for the industry.

Continuous improvement efforts and a Design for the Environment (DfE) focus on improved efficiency and reduced waste eliminated 80% of the waste slurry generated from MWS operations. A full description is included in the response to Question 31.

Wafer etching operations after slicing have changed significantly since plant startup in 1980. After slicing, wafers have surface damage and saw marks which are removed be chemical etching. Both acid etching methods and caustic etching methods are used. For most of the 1980s, the dominant etching method was based on caustic etching using potassium hydroxide solutions to remove bulk surface damage. Acid etching using HF, HNO3, and CH3COOH was used to improve surface quality. Etched wafers were rinsed with water to stop the etching process.

In the late 1980's surface quality requirements and wafer cleanliness standards required conversion of most etching operations to acid etching resulting in significant increases in the use if HNO3 and HF acids, greater use of lime for neutralization, and greater sludge volumes from fluoride removal. These changes along with other changes in cleaning technology required major upgrades to the capacity of the WWTP.

After etching, the outer edge of the wafer is rounded and wafers are lapped to establish final thickness and flatness specifications. No significant changes have occurred in edge rounding since startup. Edge rounding waste includes water and silicon particles which are removed at the WWTP.

Lapping operations have only changed slightly since 1980 with minor changes in lapping solutions and a change from silicon carbide grit to aluminum oxide grit. Lapping wastes include aluminum oxide within a viscous colloidal silica. Original lapping slurry also contained citric acid but was discontinued sometime in the 1980s.

Wax mounting operations have not significantly changed; however, significant changes occurred in wax formulations over time. After lapping wafers are mounted onto polishing plates with wax. Original wax solutions used from 1980 until 1986 had Trichloroethylene as an ingredient in the wax formulation. TCE was also used to clean residual wax off of polishing plates.

Wacker Chemie AG, Research and Development group developed a wax that did not rely on TCE and a water based wax formulation was introduced in Portland in 1986. By 1989 all TCE was removed from processes. In 1996 a new thin wax was introduced to Fab 2 containing some toluene. The new wax retains the water based cleaning technology and all residual wax is captured and shipped offsite as hazardous waste.

Wafer cleaning operations have changed significantly over time. Original cleaning processes were aqueous based followed by a dewatering step using Freon. In approximately 1986, projects were initiated to reduce and eliminate all uses of Freon by re-engineering the wafer cleaning processes. The cleaning steps were changed to create a hydrophobic surface causing water to bead up on the surface in the last step of the cleaning process followed by a centrifugal spin dryer to quickly throw water droplets off the surface of the wafer before they could dry and create a stain. These changes eliminated the use of solvent drying steps in the process. The last Freon use was

approximately 1993. In 1996 a new wafer drying step was introduced in Fab 2 which uses a fraction of a milliliter of vaporized isopropyl alcohol to absorb residual water off each wafer. The IPA vapor is removed by general exhaust.

Epitaxial processes remain essentially the same except for improvements in equipment and higher volume.

The name was changed from Wacker Siltronic Corporation to Siltronic Corporation in 2004, but the facility remains an operating silicon wafer manufacturer at present. Process changes are related only to increased capacity and improved manufacturing efficiency and quality.

Drawing GRA-607B is attached which documents the location and date of each addition (SCOEPA00112926).

21. At each Property, did you ever use, purchase, generate, store, treat, dispose, accept, or otherwise handle any waste, or material? If the answer to the preceding question is anything but an unqualified "no," identify

    a. in general terms, the nature and quantity of the waste or material so transported, used, purchased, generated, stored, treated,/disposed, accepted, or otherwise handled;
    b. the chemical composition, characteristics, physical state (e.g., solid, liquid) of each waste or material so transported, used, purchased, generated, stored, treated, disposed, or. otherwise handled;
    c. how each such waste or material was used, purchased, generated, stored, treated, transported, disposed or otherwise handled by you;
    d. the quantity of each such waste or material used, purchased, generated, stored, treated, transported, disposed or otherwise handled by you; and
    e. all documentation regarding the wastes or materials detailed in the RCRA Info Detailed Facility Report(s) for the Property, including but not limited to:
        i. benzene;
        ii. bromine;
        iii. cadmium
        iv. chromic acids;
        v. freon;
        vi. tetramethylammonium hydroxide; and
        vii TCE.

Response:

Siltronic never purchased or accepted waste materials for storage, treatment, or disposal. Siltronic has generated its own waste materials, stored them for less than 90 days and treated, disposed or recycled them.

Chemicals

The Environmental and the Health and Safety departments review chemical requests prior to bringing new chemicals on site. The end user within the company completes a Chemical Use Request and Approval Form and submits a MSDS to initiate the approval process. (SCOEPA00054183 - SCOEPA00054184. The Chemical Use Request and Approval Form and the associated MSDS were designed to collect information on the chemical's composition, physical state, storage, usage, and record decisions concerning disposal. These completed chemical request forms have been required for new chemicals since January 2000. Chemicals brought on site prior to 2000 may or may not have an associated chemical request form. However, all should have a MSDS. A database of all MSDS is produced in response to question 33.

Once a chemical is approved, it is entered into the Aspect and the Chemical Information databases. Data are available in the Aspect database from 2004 to present. Data are available in the Chemical Information database from 2000 to present. Yearly usage quantities are tracked using information from the purchasing system. Inventory data is available from 1997 to present. Chemical data for the year 2007 is provided (SCOEPA00115455-SCOEPA00115459). Some data prior to 1997 may be available on Microfilm, but those records have not been reviewed or produced.

Wastes

The majority of wastes produced at Siltronic are liquids disposed of by discharging the wastewater into a designated liquid drain system. The correct operation of the drain system is critical to the operation of the Waste Water Treatment Plant (WWTP) and to meet the permitted discharge limits of the waste streams. Each new employee is instructed in the workings of the drain systems and the importance of segregating waste material into the proper drain. The tables below list the type of systems, drains and the treatment method associated with each drain. This table is posted by each sink in the process areas.

Process Building Drain Collection System and Treatment Methods

System	Description	Generally Permitted Chemicals
CAD/CAED (Fab 2 only)	Concentrated Acid Drain	Hydrofluoric (HF) Nitric acid (HNO_3) Hydrochloric acid (HCl) Sulfuric acid (H_2SO_4)
WAD	Weak Acid Drain	Sodium hydroxide (NaOH) - dilute Nitric acid (HNO_3) - dilute Hydrochloric acid (HCl) - dilute Sulfuric acid (H_2SO_4) - dilute
CCD	Concentrated Caustic Drain	Sodium hydroxide (NaOH), Potassium hydroxide (KOH)

OWW	Organic Waste Water	Surfactant, detergents, wetting agents, glycol, polishing slurries, ammonium hydroxide, TMAH (Tetra Methyl Ammonium Hydroxide), TEA (Triethanolamine), potassium carbonate, citric acid, acetic acid Dilute: acetone, ethyl alcohol, isopropyl alcohol, hydrogen peroxide
SWW, SSW	Silicon Solids Waste Water	Silicon grinding waste, silicon carbide, Lutensol, aluminum oxide
BD	Blow Down	Cooling water, city water
D	Domestic (Sanitary Waste Water)	Kitchen sinks, restrooms, general water fountains.
CAW	Chromic Acid Drain	Chromic acid, chromium trioxide, potassium dichromate

NOTE: This table does not contain all the chemicals used at this plant

Drain Collection System and Treatment Methods

The following table lists the types of drain systems, the treatment given to each waste system, and its discharge point.

Description	**Treatment**	**Discharge Point**
Concentrated Acid Drain	Neutralization Fluoride precipitation	Willamette River
Weak Acid Drain	Neutralization	Willamette River
Concentrated Caustic Drain	Used for neutralization	Willamette River City of Portland
Organic Waste	Neutralization	City of Portland
Silicon Solid Wastewater	Neutralization	City of Portland
Blow Down	Mixes with combined effluent	Willamette River
Domestic	None	City of Portland
Chromic Acid Waste Drain	None	Chromic Acid waste solution shipped off-site as hazardous waste
Silicon solids Waste water	Neutralization	Willamette River Sludge currently to Landfill

For most other wastes, the physical state, nature and chemical composition, color, and odor is physically characterized by its associated profile. See SCOEPA00054237-SCOEPA00054240 In a few instances, wastes are not profiled by their physical characteristic properties. Instead, the waste characteristics are determined based on generator knowledge (i.e. cardboard), MSDS (i.e. lab packs), or by analysis (i.e. stormwater).

Waste handling instructions for SCO personnel are found in Procedure *P-27.10.02/0004* Environmental Guidance. This procedure outlines generation, storage, labeling, inspections, training, and disposal activities. This procedure is located on Siltronic's Intranet site and is available to all employees. See SCOEPA00115482-SCOEPA00115535.

Hazardous and non-hazardous wastes are characterized by an Environmental Engineer using a checklist. Once the checklist is complete, a profile is developed and the material is added to the Listed Wastes/Characteristic Waste Table and/or to the Waste Determination and Characterization

notebook. . (SCOEPA00054237-SCOEPA00054240, SCOEPA00054192-SCOEPA00054193) Completed hazardous and universal waste profiles are currently sent for approval to either Veolia Environmental Services or to Burlington Environmental Services (PSE). Profiles for non-hazardous materials are sent to Waste Management (Hillsboro Landfill), Emerald Environmental Services, and Univar for approval as needed. See SCOEPA00054189 for past environmental vendors. Working with the vendor, the environmental engineer determines the waste's annual sampling requirements. Any waste material chosen for additional sampling is then added to the Annual Environmental Sampling spreadsheet. See SCOEPA00054190-SCOEPA51491.

See SCOEPA00054189 for past environmental vendors. Working with the vendor, the environmental engineer determines the waste's annual sampling requirements. Any waste material chosen for additional sampling is then added to the Annual Environmental Sampling spreadsheet, included in the responsive documents.

An Environmental Engineer schedules the shipments of hazardous, non-hazardous, and universal waste by the approved environmental vendors. The Environmental Engineer also reviews and approves manifests, labels, etc. After the shipment has been completed, the manifests are entered into the waste shipment database. The manifests and LDR's are retained permanently as per SCO Records Procedure, *P-09.99.02/0015,* (SCOEPA00124763-SCOEPA00124813). Shipments of materials for recycling, i.e. paper and packing materials are scheduled by the Clean Operations department to the approved environmental vendors.

Generation and management statistics are reported annually via the annual Hazardous Waste Report submitted to the Oregon Department of Environmental Quality. These reports are available from 1991 to 2007. Quarterly and biannual hazardous waste reports are available for the years 1980-1991. Additionally, some wastes are reported to the Environmental Protection Agency via the Toxic Release Inventory (TRI). TRI reports are available from 1995 through 2006. These reports are produced in the responsive documents.

Chemicals listed in subpart (e)

For the specific chemicals listed in part (e), the following information is available

i. benzene; No historical or current use of benzene by Siltronic is identified in records
ii. bromine; No historical use of bromine identified. Current use is time release bromine tablets for control of biological growth in scrubbers and cooling towers. Bromine time release tablets have been in use since l999.
iii. cadmium; No record of a process use of cadmium.
iv. chromic adds; Chromic acid is used for crystal defect delineation in the materials Characterization Lab. Historically chromic acid was used for etching. All chromic wastewater was isolated and collected in a dedicated waste chromic acid system. Chromic containing wastewater was pumped through double contained piping to an outside above ground storage tank with secondary containment. Waste water containing chromic acid was shipped off-site for treatment from 1980 until the mid 1980s. A cover and building was added to keep rain water out of the tank secondary containment system in the early 1980s and the waste tank was replaced with a chromic acid waste water treatment system

in approximately 1987. Chromic waste water was treated in 300 gallon batches onsite. Chromic waste water was converted to chromium hydroxide sludge and managed as a hazardous waste. Treated waste water was sent to the WWTP for further treatment and discharge. Waste minimization projects continued until the chromic treatment system was replaced with a tote fill station in the late 1990s. The chromic waste treatment system was decommissioned and dismantled in 2002. (See Chromic Decommission Project, Chromic final rinse water analysis and Chromic Waste Treatment Procedure SCOEPA00115349-SCOEPA00115353).

v. Freon; Freon was used as a dryer to remove water from the surface of wafers after aqueous cleaning processes from startup of operation until it was phased out the late 1980s and completely eliminated in approximately 1992 in conformance with the Montreal Protocol to phase out CFC use. Freon was replaced by re-engineering the wafer cleaning process and adding spin dryers to quickly remove water from the surface of wafers.

vi. lab packs; Small amounts of chemicals typically generated from laboratory wastes or out of date reagent chemicals are grouped together by hazard class and shipped as hazardous waste in lab packs. Hazardous waste manifests and waste reports show several lab pack shipments.

vii. spent acids from etching; Spent acids from etching processes are treated onsite. Acid etch wastes and waste water are isolated in the CAD (concentration acid drain) system by gravity flow though double contained piping with leak detection to a CAD forwarding sump. The CAD forwarding sump is a lined FRP tank inside a chemically coated concrete secondary containment sump. The CAD wastewater is transferred to the onsite wastewater treatment plant for fluoride removal and neutralization. The fluoride is precipitated by lime, settled, dewatered by filter press and sent to a local landfill as non-hazardous solid waste under a special waste disposal permit. The filtrate is neutralized and discharged under an NPDES permit to the Willamette River.

viii. tetramethylammonium hydroxide; TMAH is used in dilute concentrations in wafer cleaning and wax removal processes as a substitute for ammonium hydroxide in current operations. Cleaning solutions containing TMAH are discharged to the OWW (Organic Waste Water) system where it is neutralized and discharged to the city POTW under an NPDES Pre-Treatment permit.

ix. TCE. Records indicate that TCE was used as an ingredient in wax. The wax was used to mount silicon wafers to plates for a polishing machine. TCE was also used for polishing plate cleaning after the polishing step. Waste TCE was collected in an underground tank until approximately 1983 and in an above ground tank system from approximately 1983 until 1989 when TCE use was discontinued. Waste TCE was recycled off-site except for an apparent short term test of a TCE still installed in room D-125. No records have been located to describe the duration of use of the still. Waste water containing trace amounts of TCE was treated in a steam stripper. TCE still bottoms were containerized and shipped off site as hazardous waste. Treated waste water was tested daily for TCE residual to meet permitted discharge requirements and sent to the OWW (Organic Waste Water) system. The OWW system performs elementary neutralization prior to discharge to the city POTW under an NPDES Pre-Treatment permit.

22. Describe all activities at each Property that was conducted over, on, or adjacent to, the Willamette River. Include in your description whether the activity involved hazardous

substances, waste, or materials and whether any such hazardous substances, waste, or materials were discharged, spilled, disposed of, dropped, or otherwise came to be located in the Willamette River.

Response:

Historic (pre-1978):

Overwater activities on the Siltronic property include the former Western Transportation facility, which refueled tugboats circa 1930-1940. The timeframe of the tugboat refueling operations is unclear, but aerial photography suggests that operations were suspended between 1940 and 1955.

See also response to question 18, concerning historical hazardous waste disposal by Northwest Natural.

During Siltronic Ownership (1978-present):

Apart from the historic overwater activities described above, Siltronic operations did not and do not include activities over, on or adjacent to the Willamette River.

23. For each Property at which there was or is a mooring facility, dock, wharf or any over-water structure, provide a summary of over-water activities conducted at the structure, including but not limited to, any material loading and unloading operations associated with vessels, materials handling and storage practices, ship berthing and anchoring, ship fueling, and ship building, retrofitting, maintenance, and repair.

Response:

See response to Question 22, above. All historical evidence of the tugboat refueling operations prior to Siltronic's ownership is being provided with these responses. No mooring facilities, docks, wharves, or any other overwater structures are currently present.

24. Describe all activities conducted on leased aquatic lands at each Property. Include in your description whether the activity involved hazardous substances, waste, or materials and whether any such hazardous substances, waste, or materials were discharged, spilled, disposed of, dropped, or otherwise came to be located on such leased aquatic lands.

Response:

Siltronic does not believe that any aquatic lands lease exists between Siltronic and the State of Oregon. Current activities over an aquatic *easement* (as opposed to a lease), as described in response to Question 14, entail permitted discharge (via outfall WR-66) of treated process water to the Willamette River, which does not contain any hazardous substances, waste, or materials. In-river sediment data collected suggest either a potential historical release of TCE via outfall WR-66, or an overwater release by an unknown third party as further described in responses contained in Sections 6 and 7 of this document. Please refer to SDMS-1258448 for more details.

25. Please describe the years of use, purpose, quantity, and duration of any application of pesticides or herbicides on each Property during the period of investigation (1937 to the present). Provide the brand name of all pesticides or herbicides used.

Response:
Siltronic has no knowledge of application of pesticides or herbicides on the Property prior to its acquisition in August 1978.

Pesticides:
Contracted applications: Siltronic has contracted outside pest control services in the past. Part of these services involved the application of pesticides. From past purchase orders, payment records, and contact correspondence the following is thought to be true:
2007 – Present: Siltronic contracted with Terminix Commercial for control of bugs including: box elder bugs, nuisance beetles and bees. From conversation with Paul Roshak, from Terminix, he estimates that we use: 2 oz Ant Bait per year, 6 oz Demand per year (no longer using in 2008), 1 oz Wasp Freeze per year, and 100 oz Generation Rodent Bait per year.
1996-2006: Siltronic contracted with Paramount Pest Control for extermination of rats, mice, non-wood ants and crawling insects. Demand CS was used for the ants and crawling insects. Contacted Kris Donahue from Paramount Pest Control and there are no electronic records of usage. Kris Donahue stated some paper copies of purchase orders are archived and may be available in storage at Paramount. Additional records are not produce for this submittal.
2005: Siltronic contracted with Trugreen for application of Flight Control to control Geese. 60 lbs used in 2005.
1979 – 2005: No paper or electronic records exist at Siltronic for this timeframe. Some microfilm records of older Purchase Orders, back to 1983, exist and may include purchase orders for landscaping, however, they have not been produced, but will be provided if further inquiry is requested.

Siltronic has evidence that the pesticide contractor was Commercial and Residential Pest Control from 1981 to some later date in this time-frame. See SCOEPA00054320. A letter that included pesticide formulations from 1981 is included in the responsive documents. See SCOEPA00054321- SCOEPA00054330.

1937 – 1979: The land was not in Siltronic's possession.

Siltronic application of Pesticides: The following pesticides have been applied as a part of grounds keeping over the past four years. Employee Steve McMahon, was interviewed and provided the following information:

2007 – Present: Goose Chase, a Goose repellent used seasonally when Geese are a problem (estimate one gallon per month for 8 months)
2006 – 2007: Flight Control Plus, a Goose repellent used seasonally when Geese are a problem (72 lbs in 2006, and 72 lbs in 2007)
2004 – Present: Raid Wasp Killer a bee killer used seasonally when bees present a problem (estimate 12 cans a summer)

Prior to 2004 recalls that Bitter Apple, a Deer repellent was used one time in 1999 to protect Fab 2 shrubs.
1979 – 2003: No paper or electronic records were located at Siltronic for this time frame. Siltronic believes that all landscaping during this time period was performed by outside vendors.
1937 – 1979: The land was not in Siltronic's possession.

Herbicides:
Contracted applications: Siltronic has contracted outside landscaping services in the past. Part of these services involved the application of herbicides. From past PO's, payment records, and contact correspondence the following is thought to be true:

2005 – Present: Siltronic contracted with Dennis' Seven Dees Landscaping. Steve Atkinson, from Dennis' Seven Dees, was contacted and he estimates that they use 36 oz of Round Up and 9 oz of Speed Zone per year.
1998 – 2004: Siltronic contracted with TruGreen. Scott Morstad, from TruGreen, was contacted to determine what they had applied. He said that they only keep electronic records for the previous three years and no records are available. Some paper copies of purchase orders are archived and may be available in storage at TruGreen. Additional records are not produced for this submittal.
1994 – 1998: Siltronic contracted with Northwest Landscape. Looking back in our database Siltronic believes that they may have changed their name to Trugreen in 1998.
1979 – 1994: No paper records exist for this timeframe. Some microfilm records of older Purchase Orders, back to 1983, exist and might include some purchase orders for landscaping, however they have not been produced, but will be produced if further inquiry is requested
1937 – 1979: The land was not in Siltronic's possession.

Siltronic application of Herbicides: The following herbicides have been applied as a part of grounds keeping over the last four years. Employee Steve McMahon, was interviewed. The following herbicides have been used to control weeds and blackberry brush from 2005 to present:

Herbicide	Year	Used	lbs/Unit	Total Yearly Lbs Used
Snapshot 2.5 G Herbicide	2005	4 Bags	50	200
Snapshot 2.5 G Herbicide	2006	4 Bags	50	200
Snapshot 2.5 G Herbicide	2007	2 Bags (then discontinued use)	50	100
Round Up Pro	2005	3 Bottles	10	30
Round Up Pro	2006	10 Bottles	10	100
Round Up Pro	2007	5 Bottles	10	50
Casoron	2005	5 Bags	8	40
Casoron	2006	5 Bags	8	40
Casoron	2007	1 Bag	8	8
Crossbow	2005	6 Bottles	2	12

Crossbow	2006	6 Bottles	2	12
Crossbow	2007	discontinued use	0	0

1979 – 2003: No paper or electronic records were located for this timeframe. Siltronic believes that all landscaping during this time period was performed by outside vendors. Siltronic has evidence that the contractor was Commercial and Residential Pest Control from 1981 to some later date in this time-frame. (see SCOEPA00054320). A letter proposal that included weed control formulations from 1981 is included in the responsive documents (SCOEPA00054321 - SCOEPA00054330). The proposal was in response to Steve Beiswenger, Facilities Engineering Supervisor, at the time.

26. Describe how wastes transported off the Property for disposal are and ever were handled, stored, and/or treated prior to transport to the disposal facility.

Response:

Waste materials generated from crystal growing operations include scrap silicon, quartz, and graphite parts from furnace rebuilds. Scrap silicon was sold for remelt and solar products. Quartz parts were sold for recycle into glass products or disposed as solid waste. Graphite parts were disposed as solid waste. Waste from crystal shaping included silicon particles and wastewater. Silicon particles were disposed as solid waste and wastewater was treated to remove fine suspended particles at the onsite WWTP. Two-thirds of solid wastes are recycled and the remaining wastes are landfilled when a recycler cannot be found. Treatment sludge has been recycled by thermal processing and blended with soil and sold as top soil. The contained lime sweetens the soil and the silicon fines break up clay soils.

Waste materials from slicing include silicon particles and wastewater. Silicon particles were separated by gravity in a settling sump and disposed in a solid waste landfill as solid waste. Wastewater is sent to the local POTW to treat the surfactant.

Wastes produced from MWS slicing include waste SiC and glycol slurry reject from the slurry recycling system and wire. The wire is generally recycled depending on the scrap steel market conditions. Reject slurry mixed with other solids containing wastewaters is dewatered by filter press. The solid sludge is landfilled.

Wastes from caustic and acid etching processes included wastewaters from rinsing operations, and spent caustic and acid etch solutions. All wastewaters from etching operations were neutralized in the onsite WWTP. The fluoride was precipitated with lime as calcium fluoride, dewatered and disposed as a non-hazardous waste in a landfill.

All lapping wastewater is neutralized and sent off-site to the local POTW.

Waste wax containing TCE was containerized, stored in a 90 day storage area, and shipped offsite has hazardous waste. Waste TCE from plate cleaning processes, was collected in an underground tank system between 1980 and 1983 when the UST system was replaced with an above-ground

storage tank system with secondary containment. Waste TCE was periodically pumped from the storage tanks and shipped for recycle at Van Waters and Rogers in Portland. Rinse water after a TCE cleaning step was collected in the same UST and AST systems. Rinse water was processed through a steam stripper to remove residual TCE. After treatment the water waste was sent to the local POTW under an NPDES Pre-treatment Permit. Still bottoms from the steam stripper were containerized, stored in a 90 day storage area and shipped off-site as a hazardous waste.

Waste Freons were containerized, stored in a 90 day storage area and shipped off-site as hazardous waste. There are two exceptions to this statement. A Freon recycling experiment was tried to recover Freon from waste. A small commercial distillation unit (Baron Blakeslee HRS 60) was tested to recover spent Freon. The Freon distillation experiment was not successful and off-site shipments continued. Freon which contained no contaminants other than water was processed onsite without distillation by recirculation through a molecular sieve to capture and remove water content. When the reclaimed Freon met new quality specifications and then was returned to the fresh Freon tank for reuse. The molecular sieve was regenerated by forcing all Freon back to the storage tank, venting the sieve column and blowing compressed air through the open sieve to evaporate the trapped water.

Aqueous cleaning wastewaters and rinse waters are treated at an on-site wastewater treatment plant and after meeting permit requirements the effluent is discharged. Treated inorganic effluent is discharged to the Willamette River. Treated organic wastewater is discharged to the local POTW for further treatment.

Stormwater is discharge directly to the Willamette river after solids settling in catch basins. It is not managed off-site.

The processes for qualifying and purchasing services from vendors that have a direct impact on environmental performance at Siltronic are outlined in the Procedure *P-27.10.02/0005* Environmental Vendor Qualification. SCOEPA00115584-SCOEPA00115590. Environmental vendors include hazardous waste haulers and recyclers, solid waste haulers and recyclers, environmental laboratories and consultants, and environmental trainers. New vendors are evaluated, and if necessary audited, by the Environmental Department. Once the evaluation is complete, the Environmental Manager authorizes new vendors to be placed on the environmental approved vendor list.

Waste handling instructions for Siltronic personnel are found in Procedure *P-27.10.02/0004* Environmental Guidance. This procedure outlines generation, storage, labeling, inspections, training, and disposal activities. This procedure is located on Siltronic's Intranet site and is available to all employees. See SCOEPA00115482-SCOEPA00115535.
The supervisor responsible for the process that created the waste stream is responsible for assuring that all applicable waste generation and storage requirements are met. See SCOEPA00115570-SCOEPA00115574. Regular inspections of satellite accumulation areas and 90 day storage areas are conducted in the process areas as part of the Cleanliness and Compliance Audit program. These inspections are conducted weekly by process area owners, reviewed monthly by the environmental department and reported monthly to management.

Hazardous and non-hazardous wastes are characterized by an Environmental Engineer. A waste characterization checklist (see SCOEPA00115575-SCOEPA00115578) is used in which the following questions are asked:

- Is the waste included in EPA's list of hazardous wastes?
- Is it corrosive?
- Is it ignitable or flammable?
- Is it reactive?
- Is it toxic or extremely hazardous?

Once the checklist is complete, a profile is developed and the material is added to the Listed Wastes/Characteristic Waste Table and/or to the Waste Determination and Characterization notebook. See SCOEPA00115579-SCOEPA00115580. Completed hazardous and universal waste profiles are currently sent for approval to either Veolia Environmental Services or to Burlington Environmental Services (PSE). Profiles for non-hazardous materials are sent to Waste Management (Hillsboro Landfill), Emerald Environmental Services, and Univar for approval as needed. See SCOEPA00115581for past environmental vendors. Working with the vendor, the environmental engineer determines the waste's annual sampling requirements. Any waste material chosen for additional sampling is then added to the Annual Environmental Sampling spreadsheet. See SCOEPA00115582.

An Environmental Engineer schedules the shipments of hazardous, non-hazardous, and universal waste by the approved environmental vendors. The Environmental Engineer also reviews and approves manifests, labels, etc. After the shipment has been completed, the manifests are entered into the waste shipment database. The manifests and LDR's are retained permanently as per SCO Records Procedure, *P-09.99.02/0015* (SCOEPA00124763-SCOEPA00124813). See hazardous waste manifests and non-hazardous waste invoices/bills of lading. It may be possible that additional invoices/bills of lading for non-hazardous wastes exist, but they have not been located. Shipments of materials for recycling, i.e. paper and packing materials are scheduled by the Clean Operations department to the approved environmental vendors.

Generation and waste management statistics are reported annually via the annual Hazardous Waste Report submitted to the Oregon Department of Environmental Quality. These reports are available from 1991 to 2007. Quarterly and biannual hazardous waste reports are available for the years 1980-1991.

27. Has Respondent ever arranged for disposal or treatment or arranged for transportation for disposal or treatment of materials to any Property (including the Willamette River) within the Investigation Area? If so, please identify every Property that Respondent's materials were disposed or treated at in the Investigation Area, In addition, identify:

    a. the persons with whom the Respondent made such arrangements;

b. every date on which Respondent made such arrangements;
c. the nature, including the chemical content, characteristics, physical state (e.g. solid, liquid) and quantity (volume and weight) of all materials involved in each such arrangement;
d. in general terms, the nature and quantity of the non- hazardous materials involved in each such arrangement;
e. in general terms, the nature and quantity of any hazardous materials involved in each such arrangement;
f. the owner of the materials involved in each such arrangement, if not Respondent;
g. all tests, analyses, analytical results or manifests concerning each hazardous material involved in such transactions;
h. the address(es) for each Property, precise locations at which each material involved in such transactions actually was disposed or treated;
i. the owner or operator of each facility at which hazardous or non-hazardous materials were arranged to be disposed at within the investigation Area;
j. who selected the location to which the materials were to be disposed or treated;
k. who selected the Property as the location at which hazardous materials were to be disposed or treated; and
1. any records of such arrangement and each shipment.

Response:

Vendors used for transportation, disposal, or treatment of materials to any property within the investigation area were determined by using Yahoo Maps, Non Owned Disposal Sites/Transporter Survey, and the Recycle/Reuse/Reclaim Vendor List. See SCOEPA00115591, SCOEPA00115592.

Non-Hazardous Waste

Wood pallets and empty plastic chemical drums are triple rinsed and recycled. They are currently being shipped to Univar for reuse. Univar is located at 3950 NW Yeon Ave. Portland, OR 97210. It is approximately 2.74 miles from the Siltronic site. In 2007, Siltronic shipped 30.27 tons of wood pallets and 26.67 tons of used empty chemical drums back for reuse. Records were maintained from 1997 to present. Siltronic's contact person is Rick Staehle at 503-222-6245.

Styrofoam peanuts are currently being sent to Carton Service for reuse. Carton is located at 2211 NW Front Ave. Portland OR. It is approximately 4.29 miles from the Siltronic site. No records are kept by either Siltronic or Carton as to the amount handled. Carton Service may be contacted at 227-6428.

Filter press cakes, storm drain sludge, north sump sludge, and a small amount of oil contaminated soil was sent to TPS Soil Recyclers of Oregon between the years of 2001 and 2004. TPS was located approximately 6.57 miles from the Siltronic site and is no longer in business. Records of shipments are produced with the documents that are responsive to this question.

Spent wire saw slurry (silicon carbide and glycol) is currently being sent to SIC Processing for recycling. SIC Processing is located at 6949 N Cutter Circle, Portland, OR. It is located approximately 9.4 miles from Siltronic. Siltronic's contact person is Damen Doelger at 503-285-3500.

The table below shows the shipments of wire slaw slurry to SIC for recycling. Prior to 2005 wire saw slurry was recycled internally by centrifugal separation of usable SiC from smaller particles of SiC fines. Recovery efficiency was 70-78%. Fab 1 used 100% recycled SiC slurry. Fab 2 used a mixture of recycled SiC and new SiC. Recycled SiC slurry was discarded after the second use.

Discarded SiC slurry was treated onsite. SiC slurry was pumped into the sludge conditioning tank of the treatment system where it was mixed with the calcium fluoride precipitate from the fluoride treatment system at the WWTP. The mixed sludge was dewatered by filter press and land filled at Hillsboro Landfill. The glycol from the slurry was combined with other organic containing wastewater and sent to the local POTW as approved by Portland BES.

Pollution Prevention and Process refinements made it possible to reduce the amount of discarded slurry. Reuse the SiC was possible by continuous centrifugal separation of all used slurry rather than recycling it once. Continuous recycle reduced the amount of SiC consumed and reduced treatment sludge and disposal costs.

Efforts to increase the recycling efficiency and recovery of the useable SiC particles from waste resulted in the development of offsite recycling options. The highest efficiency of processing of waste slurry for SiC recovery was developed by SiC Processing based in Italy. After development of an effective recovery technology SiC Processing was encouraged by Siltronic to explore additional customers in the US and locate a facility in the Northwest. SiC Processing built a plant in Portland and supplies recovered SiC to Siltronic and to other wafer sites in the US. Another pollution prevention bonus is that the local reclaim operation has the ability to recover the glycol for return to Siltronic for reuse and the elimination of another waste stream.

Recycled Wire Saw Slurry in Tons (from recycle report)

Year	jan	Feb	mar	apr	may	jun	jul	aug	sep	oct	nov	dec	Total
2005	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	59.05	0.00	59.05
2006	47.24	0.00	236.20	0.00	0.00	236.16	0.00	0.00	134.06	67.03	0.00	0.00	720.70
2007	19.91	148.64	70.10	0.00	0.00	384.78	0.00	0.00	0.00	144.00	192.00	96.00	1055.43
2008	144.00	24.00	96.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	264.00

Discharges to the Willamette River

Discharges to the Willamette River include treated effluent and stormwater runoff. Treated effluent is controlled by a state of the art wastewater treatment plant (WWTP), sixteen highly

trained operators, two chemists and a supervisor. The WWTP operates under NPDES permit #93450 originally issued by the Oregon Department of Environmental Quality (ODEQ) on September 28th, 1978 and renewed each five years. The WWTP was upgraded in 1992 with a $1.75 million expansion and in 1996 with an $18 million project and construction of a parallel treatment plant. The ODEQ permit manager of the NPDES permit is Elliot Zias.

Storm water is controlled by over 90 stormwater catch basins, oil/water separators, and a sedimentation sump for certain roof drains. Catch basins, oil/water separators and sediment traps are cleaned twice per year. Parking lot areas are swept once per year. Stormwater is sampled four times per year and reported annually to ODEQ. The stormwater conveyance system combines with treated effluent in the original portion of the plant and is a completely separate system for the administration areas and newer construction. A 1200Z Stormwater permit was originally issued by ODEQ on July 22, 1997 and has been updated every five years. (Prior to that date, Siltronic operated under a 1200L stormwater permit which was issued on 9/24/91. This permit was replaced by the 1200Z permit in 1997.) The ODEQ permit manager for the 1200Z permit is Dennis Jurries. These permits are included as documents responsive to Question 52.

The Facility Lab collects weekly effluent samples to test for nitrates, BOD, TSS, TTO, Fluorides, Phosphates, Hydrogen Peroxide, Ammonia, Chromium, and COD. Temperature, pH, and flow are monitored continuously. Monitoring instrumentation is calibrated by scheduled preventive maintenance and all critical alarm points are monitored 24 hours per day. Monitoring results are reported monthly to ODEQ.

Since 2006, TTO, BOD, and Total Chromium samples are sent to Specialty Analytical for analysis. The Facility Lab completes all other testing. The results of these tests are entered into the Permit and Testing Database and/or into the Current database. Non-detected values are entered into the database as half the detection limit values for the calculations in conformance with DEQ guidance,. The Facility Lab maintains files of test results. The Permit & Testing database includes data from the present back to 1999. The Current database contains data from 2004 to the present. Hard copies of monthly monitoring reports (DMR) are part of the permanent record. Temperature and pH data are collected continuously on chart recorders. Strip charts are retained for three years. Temperature and pH data are monitored continuously. See SCOEPA00054782-SCOEPA00054792. Analytical results are retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records (SCOEPA00124763-SCOEPA00124813).

Flows are also entered into the databases. The total flow to the Willamette River is a combination of combined effluent from the waste water treatment plant; meter vault # 3 (MV#3) flows from non-contact cooling water and RO reject, City water pre-filter backwash and stormwater. The Permit & Testing database includes data from the present back to 1999. The Current database contains data from 2004 to the present. See SCOEPA00054782-SCOEPA00054792. Data prior to 1999 is not available. Flow data is retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records. (SCOEPA00124763-SCOEPA00124813)

Stormwater is tested for copper, lead, zinc, pH, TSS, and oil/grease. TSS, and pH are tested in

house by the facilities lab. All other analyses are completed by Specialty Analytical. The results of the testing are entered into the Benchmarks data spreadsheet. The Facility Lab and the Environmental Affairs department maintain files of the analysis. This Benchmark data spreadsheet has results back to 1996. See SCOEPA00054797- SCOEPA00054798. Data prior to 1996 is not available. Analytical results are retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records (SCOEPA00124763-SCOEPA00124813).

Hazardous Waste

Hazardous Waste is no longer being sent to any property within the investigation area.
From 1981 to 1988, Siltronic shipped TCE and Freon for recycling to Van Waters & Rogers located at 3950 NW Yeon Ave. Portland, OR 97210. In 1987, Siltronic shipped 4 PCB capacitors to General Electric Company located at 2535 NW 28th Ave., Portland, OR 97210.

Vendors

The processes for qualifying and purchasing services from vendors that have a direct impact on environmental performance at Siltronic are outlined in the Procedure P-27.10.02/0005 Environmental Vendor Qualification (SCOEPA00115584-SCOEPA00115590). It is the purchasing department's responsibility to review the approved environmental vendor list and to notify the environmental manger of any new vendors that require environmental evaluation and approval. The new vendors are evaluated, and if necessary audited, by the Environmental Department. Once the evaluation is complete, the Environmental Manager authorizes new vendors to be placed on the environmental approved vendor list.

28. Describe the plants and other buildings or structures where Respondent carried out its operations at each Property within the Investigation Area (excluding locations where ONLY clerical/office work was performed).

Response:

There are 27 buildings or structures on the Siltronic site. These are detailed in the Site Overall Building Location Plan, Siltronic drawing 1A008 (SCOEPA00115599); an image of the building list and location plan. Because certain locations identified in the diagram include locations relevant to process information, including locations where hazardous chemicals are stored, this information is CBI both for business reasons and out of concern for new Department of Homeland Security regulations.

The Administration Building and the only building where ONLY clerical/office work is performed.

The major manufacturing buildings are Fab 1 Manufacturing, where 150mm wafers are produced, and Fab 2 Manufacturing, where 200mm wafers are produced. These buildings are a mixture of manufacturing, support areas, and office areas. Detailed descriptions of these areas are described on the following Siltronic Drawings:

Fab 1 Building Overall Occupancy Diagram, SCO drawing 2A381 (SCOEPA00115600)

Fab 1 Building Area "L" Architectural Code Summary, SCO drawing 2A381A. See SCOEPA00115601.
Fab 2 Building Code Summary Diagram, SCO drawing 6A0 (SCOEPA00115602).

Other buildings or structures on the site house the Siltronic Waste Water Treatment facility, facilities systems, waste forwarding, bulk chemicals and gasses, chemical storage, and general storage, are detailed in the drawings provided in response to this question.

29. Provide a schematic diagram or flow chart that fully describes and/or illustrates the Respondent's operations on each Property.

Response:

Fab 1 and 2 Operations processes raw monocrystalline silicon ingots and through successive manufacturing stages turns them into ultrapure silicon wafers for various customers in the integrated circuit industry.

Fab 1 deals with ingots and wafers that are circular in shape and 125mm and 150mm diameter.

A flow chart, which includes Confidential Business Information (CBI) is included in the responsive documents labeled as CBI, describes the various process steps that the silicon crystal goes through before it turns into the finished product, which is a polished silicon wafer of various thicknesses that has a mirror finish on it. About 50% of the factory volume then goes through an additional step where a silicon layer about 0.002 – 0.025 mm thick is applied on it before being shipped to various customers.

Each step of the process flow is identified in the flow chart and all the specific process details for each processing step including raw materials consumed and processes applied are detailed in separate tables identified as process descriptions. Documents providing these details are included in the responsive documents labeled as CBI.

Fab 2 deals with ingots and wafers that are circular in shape and 200mm in diameter. A flow chart produced with documents labeled CBI describes the various process steps that the silicon crystal goes through before it turns into the finished product, which is a polished silicon wafer about 0.7mm thick that has a mirror finish on it. About 50% of the factory volume then goes through an additional step where a silicon layer about 0.002 – 0.025 mm thick is applied on it before being shipped to various customers.

Each step of the process flow is identified in the flow chart and all the specific process details for each processing step including raw materials consumed and processes applied are detailed in separate tables identified as process descriptions. Documents providing those details are included in the responsive documents labeled as CBI.

30. Provide a brief description of the nature of Respondent's operations at each location on each Property including:

a. the date such operations commenced and concluded;
b. the types of work performed at each location, including but not limited to the industrial, chemical, or institutional processes undertaken at each location;
c. a list of the chemicals utilized in the silicon wafer and/or other manufacturing processes either as a component employed in the formulation of an object, made for sale or use on or off, or as a reagent in the manufacturing process, or as an item utilized in maintenance activities;
d. specifically provide documentation regarding, but not limited to the following:
    i. the production of silicon wafers from high purity polycrystalline silicon;
    ii. the waste streams generated from the cleaning, degreasing and etching processes;
    iii. the production and handling of waste streams that generate(d) the following contaminants:
        1. benzene;
        2. bromine;
        3. cadmium;
        4. chromic acids;
        5. freon;
        6. lab packs;
        7. spent acids from etching;
        8. tetramethylammomium hydroxide; and
        9. TCE.

Response:

Fab 1 commenced production operations during 1980. Fab 2 commenced production operations in June 1996. Both plants continue to produce silicon wafers for the Integrated Circuit Industry.

Process descriptions that detail the specific process steps that the silicon goes through before turning into a finished product are included in the responsive documents labelled as CBI. All the various chemicals used in the steps are detailed along with process conditions (example concentrations, temperatures, pressures etc.) where relevant. Documents providing those details are included in the responsive documents labeled as CBI.

All the chemicals used in the factory including those for cleaning and maintenance of tool sets are also listed separately in a table included in the responsive documents labelled as CBI.

A table has been generated that describes the supplies used at each process step and the waste products generated from that process step.

The factory does not use benzene, bromine, cadmium or TCE. Benzene related to Northwest Natural's MGP waste is discussed in questions 10 and 16 above.

Chromic acid is used in the materials characterization laboratory as an analytical testing agent for

quality control. The testing method is differential etching of silicon wafer samples to expose crystal defects. Waste minimization and process testing improvements reduced the volume of Chromic acid waste as much as 90% by 1986 and in excess of 99% by 1997. Prior to 2004 chromic etching was also used to examine seed crystal (starting crystal for crystal growing) and test slugs from silicon ingots (sections of monocrystaline silicon). Seed crystal and slug etch testing was a quality control test used to identify crystal defects know as slip – when there is a flaw in the crystal structure making the silicon ingot unsuitable for semiconductor material. All chromic acid use occurs in the analytical laboratory. Chromic acid use began in 1980 and has limited use currently. Chromic acid waste is separated in a dedicated drain and collection system. Onsite treatment of chromic acid waste occurred from approximately 1985 until 1997. All chromic acid waste is currently sent offsite for treatment. Analytical testing improvements and reduced requirements have further reduced the use of chromic acid solutions. All silicon ingot is now purchased from Germany and comes already tested and certified.

The factory does not currently use TCE or Freon within any process step. TCE was used from 1980 until 1989 in some processes. The major use was as an ingredient in wax used to mount silicon wafers to a polishing plate for a wafer polishing process. TCE solvent was also used to clean excess wax from polishing plates after wafer mounting and again to clean polishing plate prior to reuse. The only other use of TCE in the factory was a cleaning step prior to wax mounting intended to remove residual organics or oils after lapping operation. TCE based wax was replaced by an aqueous cleanable wax process in approximately 1986. Each wax mounting line (street) was changed over one at a time and the last Wax street was converted and eliminated TCE use in 1989.

Freon was used as a dewatering agent and to scavenge any residual organics after aqueous cleaning of wafers. Freon was replaced by reengineering cleaning processes to use hydrophilic surfactants and hydrophobic acid rinse followed by spin dryers. The hydrophilic surfactants would flood the wafer surface and encapsulate particles. The hydrophobic acids overcome tension dynamics causing water droplets to form on the surface. The high speed spin dryers throw the water droplets off the surface of the wafer before it can dry and cause a stain. Spin dryers and process reengineering eliminated all uses of Freon by 1993.

Lab Pack shipping of miscellaneous small quantities of chemicals have occurred since 1980. Silicon wafer manufacture requires the highest purity of process chemicals and solutions. There are numerous testing steps to verify the quality of incoming supplies and testing of in-use materials. There are four laboratories supporting the processes. Lab pack chemicals are generated from out of date or unused standards and analytical reagents from these laboratories

Acids are used for cleaning and removal of surface damage after slicing. Surface damage is removed by the bulk removal of silicon by etching with nitric acid and hydrofluoric acid. Spent acids from etching are neutralized and the fluoride is removed. After treatment to meet effluent standards, the treated effluent is discharged under an NPDES permit. Since 2000, new uses have been identified and a truck loading station and acid blending station has been built to market the spent acid as an etching solution. Approximately 45% of the sent acid has been recycled and sold for reuse.

The factory uses Tetramethyl ammonium hydroxide to reduce biological oxygen demand from

cleaning operations. The specific steps that consume these chemicals are listed in the table included in the responsive documents, along with a description of the handling of the waste stream.

31. If the nature or size of Respondent's operations changed over time, describe those changes and the dates they occurred.

Response:

Ground-breaking for the Fab 1 factory started in 1978. The Fab 1 factory commenced operation during 1980. Process expansions and improvements increased production capacity several fold in subsequent years of operation.

TCE based wax was replaced by an aqueous cleanable wax process in approximately 1986. Each wax mounting line (street) was changed over one at a time and the last wax street was converted and eliminated TCE use in 1989.

Freon was replaced by re-engineered cleaning processes to use hydrophilic surfactants and hydrophobic acid rinse followed by spin dryers. Spin dryers and process reengineering eliminated all uses of Freon by 1993.

In October 1994, ground-breaking started for the construction of the second manufacturing facility on the site. The Fab 2 factory commenced operation in June 1996.

With the construction of Fab 2, new wafer slicing technology was developed to slice an entire silicon ingot in one pass by multi-wire saw technology rather than a single wafer slice at a time. This technology saved over 32 million gallons of water per year and increased the number of wafers from a silicon ingot by reducing saw kerf.. Fab 1 was the testing area to prove the technology and both Fab1 and the new Fab 2 were converted to the new technology.

Under the strategy for continuous improvement and, process optimization of existing processes, the Fab 2 factory became a model for waste minimization, chemical savings, and energy conservation measures. Technology developed in Fab 2 was adopted in subsequent Fabs built in Germany and Singapore.

<u>Fab 1:</u>

The Crystal Pulling operation (Czochralski Method of growing a single crystal silicon ingot from melted silicon contained in a quartz crucible) was removed from Fab 1 in 2004. The company began obtaining its crystals from Germany at that time.

Over time, customers have demanded product with better wafer geometry flatness, and capability control. Responding to this demand, Siltronic has added a back-side polishing route, more back-sealing capacity, and additional epitaxial reactors.

The process of polishing the back side of the wafer, in addition to a front side polish, started in February 2000 for more advanced flatness capability of existing polishing capacity.

To supply a higher percentage of wafers for customers making power devices, Poly furnaces were added in July 2004, and the LTO furnace started production in December 2004.

Additional Epitaxial capacity was added in May 2004 and in October 2005.

An Argon Annealing furnace started production in December 2004, but use of that furnace was discontinued by Siltronic in March 2006.

Fab 2:

In October 1994, ground-breaking started for the construction of the second manufacturing facility on the site. The Fab 2 factory commenced operation in June 1996.

Customer demand for product with better wafer geometry flatness, and/or capability control, has driven the addition of a back-side polishing route, more back-sealing capacity, and additional epitaxial reactors.

The process of polishing the back side of the wafer, in addition to a front side polish, started in February 2000 for more advanced flatness capability of existing polishing capacity.

To supply a higher percentage of wafers for customers making power devices, Poly furnaces were added in July 2004, and the LTO furnace started production in December 2004.

Additional Epitaxial capacity was added and an Argon Annealing furnace started production in December 2004, but was relocated to the Singapore factory in March 2006.

32. List the types of raw materials used in Respondent's operations, the products manufactured, recycled, recovered, treated, or otherwise processed in these operations. Also identify whether products or wastes containing TCE, freon, and/or chromic acid are still used or generated at the Property. If not, what alternative products are you using, and when did you start purchasing and using them?

Response:

The raw material used in the factory is monocrystalline silicon ingots imported from Germany. From 1980 until 2004, the monocrystalline silicon ingots were produced in crystal pullers from imported polycrystalline silicon. Siltronic uses supplies and other consumables at each process step to turn the silicon ingots into silicon wafers. The supplies and consumables used at each process step are detailed in the documents produced in response to this question and is CBI. See SCOEPA00116547-SCOEPA00116548.

Approximately 65% of all solid waste is recycled. A few examples include paper and cardboard, wood pallets, plastic, metal, oils, silicon carbide, silicon, and spent acids. Approximately 30% of wastewater is reclaimed for reuse onsite in secondary processes like cooling towers and scrubbers. Wastewater is treated in an onsite wastewater treatment plant. Treated effluent containing organic constituents is discharged to the City of Portland for organic treatment. Treated inorganic effluent is discharged to the Willamette after it meets effluent discharge requirements.

The factory does not currently use TCE or Freon within any process step. TCE was used from 1980 until 1989 in some processes. The major use was as an ingredient in wax used to mount silicon wafers to a polishing plate for a wafer polishing process. TCE solvent was also used to clean excess wax from polishing plates after wafer mounting and again to clean polishing plate prior to reuse. The only other use of TCE in the factory was a cleaning step prior to wax mounting intended to remove residual organics or oils after lapping operation. TCE based wax was replaced by an aqueous cleanable wax process in approximately 1986. Each wax mounting line (street) was changed over one at a time and the last wax street was converted over to water based wax and eliminated TCE use in 1989.

Freon was used as a dewatering agent and to scavenge any residual organics after aqueous cleaning of wafers. Freon was replaced by reengineering cleaning processes to use hydrophilic surfactants and hydrophobic acid rinse followed by spin dryers. The hydrophilic surfactants would flood the wafer surface and encapsulate particles. The hydrophobic acids overcome tension dynamics causing water droplets to form on the surface. The high speed spin dryers throw the water droplets off the surface of the wafer before it can dry and cause a stain. Spin dryers and process reengineering eliminated all uses of Freon by 1993.

Chromic acid is currently used in the materials characterization laboratory as a chemical agent for quality control. The testing method is differential etching of silicon wafer samples to expose crystal defects. Waste minimization and process testing improvements have reduced the volume of Chromic acid waste by more than 99%. Prior to 2004 chromic etching was also used to examine seed crystal (starting crystal for crystal growing) and test slugs from silicon ingots (sections of monocrystaline silicon). Seed crystal and slug etch testing was a quality control test used to identify crystal defects know as slip – when there is a flaw in the crystal structure making the silicon ingot unsuitable for semiconductor material. All silicon ingot is now purchased from Germany and comes already tested and certified. Process improvements have reduced chromic waste generation by over 99%.

Silicon slicing technology was originally single slice technology using a diamond saw. In 1995 slicing operations were converted over to multi-wire saw technology where an entire ingot is cut by a continuous wire web wetted with a silicon carbide abrasive solution. The abrasive solution is reclaimed for reuse in the slicing saws.

Etching acids consist of nitric acid and hydrofluoric acid. Normally these acids are treated creating a calcium fluoride sludge and neutralized. A market has been identified in the metals cleaning industry and up to 45% of the acids used at Siltronic are reclaimed sold for reuse. Work continues to develop an acid reclaim system that will provide semiconductor grade acids for direct

reuse.

33. Provide copies of Material Safety Data Sheets (MSDS) for materials used in the Respondent's operations.

Response:

Response: The Health and Safety department maintains a database of every chemical that has been brought on site. The data base contains the actual MSDS sheet used for the chemical brought on site and is the most comprehensive resource for this information. The online data base is accessible to all employees on site via the company intranet.
The database is maintained by our vendor, Oregon Health & Science University, Chemical Risk Information Service (CRIS). Siltronic is producing electronic copies of all the MSDS in the database in response to this question.
Some departments/areas may keep hard copies of certain MSDS in their work areas for easy reference. These hard copies are not considered official documents and are not produced because they are duplicative of the information in the database.

34. Describe the cleaning and maintenance of the equipment and machinery involved in these operations, including but not limited to:

a. the types of materials used to clean/maintain this equipment/machinery;
b. the monthly or annual quantity of each such material used.
c. the types of materials spilled in Respondent's operations;
d. the materials used to clean up those spills;
e. the methods used to clean up those spills; and
f. where the materials used to clean up those spills were disposed of.

Response:

<u>Solvent – Based Parts Cleaning</u>
In the course of maintenance and repair activities Siltronic cleans equipment and machinery parts in self-contained solvent based parts cleaners. There are four self-contained solvent based parts cleaning stations in the following locations: (1) Facilities Maintenance Shop, (2) Fab 1, Room # H-120; (3) Equipment Maintenance Shop, Fab 1 Room # D-121; and (4) Equipment Maintenance Shop, Fab 2, Room # 6D-113. These four self-contained solvent-based parts cleaning stations use either SHELLSOL® D60 solvent or NALCO 5740. Waste solvent and solvent sludge is transported off site as non-hazardous waste for recycling by qualified vendors. Current vendors are Thermo Fluids and Emerald Services. In 2007 Siltronic recycled 1,978 lbs of solvent waste. Siltronic has operated one or more self contained small parts cleaners in maintenance operations since startup. There is no record of a chlorinated solvent use in any parts cleaner. Recycled quantities for the year 2002 through March, 2008 are included in the documents produced in response to this request. see SCOEPA00117777-SCOEPA00117779.

Steam Cleaning

Steam cleaning of equipment and machinery and/or parts may be required in the course of repair or maintenance activities. Siltronic has an outdoor, covered containment area for steam cleaning that is located adjacent to the Facilities Maintenance Shop, Fab 1 Room # D121. This containment area has an oil-water separator prior to discharge into the sanitary sewer and POTW. Sludge from the maintenance oil-water separator is recycled by Thermal Fluids as non-hazardous waste. Small volumes of "Dyna-Might", a concentrated liquid degreaser produced by Landa, are used in conjunction with steam cleaning. Siltronic purchased 10 gallons from Landa since 2006 and estimates annual usage at 2.5 gal./year. Disposal records are included in the documents produced in response to this request.

Simple Green

"Simple Green", a non-hazardous cleaner is also used for cleaning of equipment and machinery. A self-contained "Simple Green" parts cleaning stations is located in the Facilities Maintenance Shop, Fab 1, Room # H-120. Sludge from this parts cleaner is disposed of in the maintenance oil-water separator (same as steam cleaner) prior to discharge into the sanitary sewer and POTW. Sludge from the maintenance oil-water separator is recycled by Thermo Fluids as non-hazardous waste.

IPA Wipes

As part of clean room protocols for semiconductor wafer manufacturing, Isopropyl Alcohol is used to wipe the surfaces of equipment, machinery, and hand tools used during maintenance activities. Wiping is normally done using 5% IPA, but may require 85%, or 99% concentration. Since December 2007, wipes used with 85% or 99% IPA are disposed of in designated containers and are transported off site by Veolia Technical Solutions L.L.C. to a fuel blending facility. Recycled quantities for 2007 and 2008 year-to-date are 110 lbs. see SCOEPA00117777. Prior to December 2007 these used wipes were disposed of in the normal trash. Wipes used with less than 85% IPA are disposed of in the normal trash.

Lubricants

Siltronic uses a variety of lubricants to maintain equipment and machinery. An inventory of lubricants used by month and by year is available electronically for the year 1997 to the present within the Siltronic SAP Annual Chemical Usage Report. A copy is provided see SCOEPA00117780-SCOEPA00117783. Purchase Order records for 1983 through 1996 are available on microfilm as part of Purchasing Department Records. However, as stated elsewhere, these records were not reviewed but are available on request.

Used oil, spent oil filters, and grease are recycled as non-hazardous waste. In 2007 Siltronic recycled the following quantities:

Used Oil	4,326 lbs
Spent Oil Filters	1,147 lbs
Grease	41.7 lbs

Recycled quantities for the year 2002 thru March, 2008 are available electronically in the Siltronic Environmental Affairs Hazardous Waste Database; see SCOEPA00117777-SCOEPA00117779. Records for prior years are paper records and are included as documents produced in response to

this request.

Spills and Cleanup

Siltronic policies and requirements for spill prevention and counter measures are detailed in the Siltronic "Spill Prevention & Countermeasures (SPCC) Plan", Siltronic document number P-27.10.02/003 (SCOEPA00112895-SCOEPA00112920). Additionally, Siltronic's management and organized response to spills and releases are included in the "Emergency Preparedness, Prevention and Contingency Plan", Siltronic document number P-27.10/001 (SCOEPA00112804-SCOEPA00112894). Siltronic maintains a trained Emergency Response Team that is trained to respond to and clean up spills. All Siltronic Employees receive annual training concerning emergency response, including response to spills.

Minor drips and spills on equipment, concrete, or other impervious areas are cleaned up immediately with absorbent materials. Absorbent materials are recycled as non-hazardous waste. In 2007 Siltronic recycled (2) 35 gallon containers and (1) 5 gallon container of absorbent materials soaked with oil. Recycled quantities for the year 2002 thru March, 2008 are available electronically in the Siltronic Environmental Affairs Hazardous Waste Database; records for prior years are paper records included in responsive documents.

Since 2002 there are two occurrences of soil cleanup and disposal related to maintenance activities:

a) In December, 2002 a contractor dripped 4931 Machine Tapping Fluid on the ground while threading conduit. Siltronic hired a contractor to cleanup the area and disposed of 14,360 lbs of oil contaminated soil.

b) In July of 2002 oil dripped onto the ground from an oil de-mister located near the Central Utilities Building. Siltronic hired a contractor to cleanup the area and disposed of 4,440 lbs of oil contaminated soil.

Disposal for both occurrences is documented in the Siltronic Environmental Affairs Hazardous Waste Database. An excerpt from the database for these disposals is included, see SCOEPA00117778-SCOEPA00117779.

Other Chemicals

Siltronic also uses a variety of adhesives, paints, and other chemicals in the course of maintaining equipment and machinery. A list of these and their annual usage is available electronically for the year 1997 to the present within the Siltronic Annual Chemical Usage Report. Purchase Order records for 1983 through 1996 are available on micro-film as part of Purchasing Department Records. The complete list of chemicals used is available but was not reviewed as part of this response. Purchase Order records, including those for chemical purchases, may not exist prior to 1983.

35. Describe the methods used to clean up spills of liquid or solid materials during Respondent's operation.

Response:

When spills of liquid or solid materials occur on the plant site the clean up method is dictated by the company's Emergency Preparedness, Prevention and Contingency Plan. This document is located on our documentation system P-27.10.02/0001. (SCOEPA00112804-SCOEPA00112894). This plan is available online and has been given to local responders and the Coast Guard. Part of the company procedure provides as follows:

> Care must be taken to avoid creating more hazardous waste than what was generated by the spill or creating a hazardous solid waste. The use of absorbent materials must be limited to blocking drains or building a containment dike. The disposal of these solid materials will be done under the direction of the environmental coordinator.
> For small spills, a mop and bucket can be used. The wash water can then be rinsed down the appropriate drain. If there is any question about which drain to use, immediately contact the Facilities Operations Supervisor or the Environmental Engineer.
> For larger spills, the ERT chemical vacuums must be used. This liquid can be disposed of by pouring or pumping it into the proper drain system or container for recycle or disposal.
> Regardless of the quantity spilled, it is most important that the spilled materials are not allowed to enter the storm water drain.
> Prior to disposal of any hazardous waste material, a Facilities Operations representative must be consulted. This is to ensure that all disposal activities comply with EPA, DEQ, and City of Portland waste management regulations, and that the Waste Water Treatment Plant (WWTP) is capable of treating the waste being sent to it. The majority of the hazardous materials at Siltronic can be treated by the WWTP. However, it is critical that the material be disposed of down the proper drain.

All employees are required to strictly follow spill reporting and spill response procedures. All employees are required to have annual Environmental Awareness training. Part of the annual training includes the Emergency Preparedness, Prevention and Contingency Plan overview of spill response, reporting, and emergency response actions. Environmental Health and Safety training is managed by the training department and all environmental and safety training is available to employees online through the intranet. Competence is measured by obtaining a passing score on a competency test at the end of each training module. Employees receive annual safety training on overall contingency plan which includes prevention of hazardous substances. Interactive training modules are accessed through Siltronic's intranet site to train every employee based on that person's responsibilities. Training completion is tracked by the training department, area supervisors and reported to upper management. Training is a component of the employee compensation rating. The training completion rate for 2007 was 99.3% and is at 89.6% for 2008 as of August 6.

Additional training is mandatory for first responders. Siltronic maintains a fully trained Emergency Response Team on site at all times. Training includes a 40 hour base training to become a member of the ERT and annual refresher training incident response, command center protocol, spill containment, response and decontamination procedures.

Health and Safety is involved in chemical clean-up by responding via the ERT (Emergency Response Team) to any spill. The ERT Captains coordinate the cleanup. ERT neutralize or contain material, take it to the hazardous materials bay and alert the Environmental Department who then have the material disposed of.

If a spill has been reported, generally Security will be notified and an ERT page is performed. ERT Captains or Primaries are alerted by this page to call Security and get information about the emergency, in this case a chemical spill of some sort. ERT are all HAZWOPER or equivalents (NFPA 472) trained and respond appropriately. As our chemicals on site are well defined, unknown situations are rare. ERT go the scene and determine what is required to mitigate the spill. Often there are local chemical drains that can be utilized. Other times the spill needs to be neutralized and collected and bagged for disposal. On occasion we have called a vendor to help with a spill clean-up or to remove a leaking drum or cylinder from our site. We have two fully stocked ERT rooms with up to and including Level A PPE and associated clean-up equipment- berms, overpacks, pigs, neutralizer, vacuums, pumps, fans and air monitors. In general 8 to 10 ERT are available at any time to assist in clean-ups.

When a spill has been cleaned up, ERT write an ERT report that gets submitted to the Health & Safety department for review and dissemination to the rest of the ERT team and most of management, including the Environmental Department. Spills that reach one half of the Reportable Quantity or seem to be of a more hazardous nature require the calling of the Emergency Coordinator. Someone in Health & Safety is on-call 24 hours per day, 7 days per week. When able, Health & Safety also oversee many of the spill mitigation activities and act as Incident Commander or Safety Officer when required. ERT are also schooled in the ICS.

Some spills are non-hazardous and are cleaned up by local employees if it is within their job scope.

Siltronic maintains a database of all chemical spills that happen on site. During 2007 there were about 1 dozen. We average one a month. This information is included in the Security and ERT reports submitted as documentation. The records are maintained for approximately three years. Incidents are recorded via the ERT report and the Security report. Security reports are recorded in a database and are tracked. Incidents are presented to upper management during our monthly review. The records are kept electronically in e-mail and in a database which is maintained by Health & Safety. Incident information is also collected and recorded by security. The security database is reviewed monthly. ERT reports are reviewed as they come in. The records are maintained for approximately three years.

36. For each type of waste (including by-products) from Respondent's operations, including but not limited to all liquids, sludges, and solids, provide the following information:

a. its physical state;
b. its nature and chemical composition;
c. its color;
d. its odor;
e. the approximate monthly and annual volumes of each type of waste (using such measurements as gallons, cubic yards, pounds, etc.); and
f. the dates (beginning & ending) during which each type of waste was produced by Respondent's operations.

Response:

Wastes

The majority of wastes produced at Siltronic are liquids disposed of by discharging the wastewater into the liquid drain system. The correct operation of the drain system is critical to the operation of the Waste Water Treatment Plant (WWTP) and to meet the permitted discharge limits of the waste streams. Each new employee is instructed in the workings of the drain systems and the importance of segregating waste material into the proper drain. The tables below list the type of systems, drains and the treatment method associated with each drain. This table is posted by each sink in the process areas.

Physical Characteristics

For most wastes, the physical state, nature and chemical composition, color, and odor is physically characterized. The waste characterization process includes information that describes the physical characteristics of the waste, waste analysis, chemical processes that generate wastes, information about other chemicals combined with the waste, and waste volume are used. The information is compared with regulatory thresholds and standards to determine the waste characteristics and waste management method. In a few instances the waste characteristics are determined based on generator knowledge (i.e. cardboard), MSDS (i.e. lab packs), or by analysis (i.e. stormwater). Extensive records are kept to track chemical purchases, chemical inventory, water use rates and wastewater volume and discharge volume, waste generation points, waste accumulation rates, waste storage quantities, and waste shipment records. Extensive records are available for wastewater discharge, non-hazardous solid waste, hazardous waste, air emissions, and recycling and are described below. Records determined to be responsive are included with this response. Other records which appear to be duplicative or not directly responsive are available but not produced.

Hazardous and Non-hazardous Wastes

An Environmental Engineer schedules the shipments of hazardous, non-hazardous, and universal waste by the approved environmental vendors. After the shipment has been completed, the manifests are entered into the waste shipment database. The manifests and LDR's are retained permanently as per SCO Records Procedure, *P-09.99.02/0015* (SCOEPA00124763-SCOEPA00124813). See hazardous waste manifests and non-hazardous waste invoices/bills of lading produced in response to this request. It may be possible that additional invoices/bills of lading for non-hazardous wastes exist. Shipments of materials for recycling, i.e. paper and packing materials are scheduled by the Clean Operations department to the approved environmental vendors. Shipments of solid waste sludges are also recorded on the recycling report by month and tons generated. See SCOEPA00117811-SCOEPA00117817.The Waste Database tracks dates and volumes of hazardous and non hazardous wastes shipped out for disposal. This database contains data from the years 2002 to present. See SCOEPA00117823-SCOEPA00117838, SCOEPA00117839-SCOEPA00117851. Shipping dates, volumes, generation, and management statistics are reported annually via the annual Hazardous Waste Report submitted to the Oregon Department of Environmental Quality. These reports are available from 1991 to 2007. Quarterly and biannual hazardous waste reports are available for the years 1980-1991 and have been produced. Additionally, some wastes are reported to the Environmental Protection Agency via the Toxic Release Inventory (TRI). TRI reports are available from 1995 through 2006. and have been produced.

Discharges to the Willamette River

The Facility Lab takes effluent samples to test for nitrates, BOD, TSS, TTO, Fluorides, Phosphates, Hydrogen Peroxide, Ammonia, Chromium, and COD. Since 2006, TTO, BOD, and Total Chromium samples have been sent to Specialty Analytical for analysis. The Facility Lab completes all other testing. The results of these tests are entered into the Permit and Testing Database and/or into the Current database. As per DEQ guidance, non-detects are entered into the database as half the detection limit values for the calculations. The Facility Lab maintains files of test results. The Permit & Testing database includes data from the present back to 1999. The Current database contains data from 2004 to the present. Temperature and pH data are collected continuously on chart recorders. Temperature and pH data is also tracked by the Citrix software system. See SCOEPA00117852-SCOEPA00117863Analytical results are retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records. See SCOEPA00117866-SCOEPA00117867, SCOEPA00124763-SCOEPA00124813.

Stormwater is tested for copper, lead, zinc, pH, TSS, and oil/grease. TSS, , and pH are tested in house by the facilities lab. All other analyses are completed by Specialty Analytical. The results of the testing are entered into the Benchmarks data spreadsheet. The Facility Lab and the Environmental Affairs department maintain files of the analysis. This Benchmark data spreadsheet has results back to 1996. See SCOEPA00117864-SCOEPA00117865. Data prior to 1996 is not available. Analytical results are retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records. See SCOEPA00117866-SCOEPA00117867-and the Environmental Affairs files.

Flows are also entered into the databases. The total flow to the Willamette River is a combination of CE from the waste water treatment plant; MV#3 flows from non-contact cooling water and RO reject, and stormwater. The Permit & Testing database includes data from the present back to 1999. The Current database contains data from 2004 to the present. Data prior to 1999 is not available. Flow data is retained by the Facility Lab and Facility Operations according to the retention time table located in procedure P-09.99.02/0015, SCO Records. See SCOEPA00117866-SCOEPA00117867.

37. Provide a schematic diagram that indicates which part of Respondent's operations generated each type of waste, including but not limited to wastes generated by cleaning and maintenance of equipment and machinery and wastes resulting from spills of liquid materials.

Response:

A waste table has been generated that describes each process step, chemicals used at each step the destination for each type of waste (spent supplies) that resulted from the process i.e. does it get recycled, go into solid waste, or go to other waste treatment areas. A process waste table is included in the documents provided for this response, which has been designated CBI.

All wastes generated during cleaning and maintenance of equipment are transported to the solvent storage area and then ultimately disposed of as hazardous waste or are recycled. Wastes generated during routine operator cleaning are stored in flammable waste containers and taken by the building maintenance staff, or by the janitorial staff, to the hazardous waste storage area for disposal offsite. Hazardous wastes resulting from spills of liquid chemicals, including absorbent pads, are transported to the hazardous waste storage area, and ultimately disposed of as hazardous waste.

38. Identify all individuals who currently have and those who have had responsibility for Respondent's environmental matters (e.g. responsibility for the disposal, treatment,. storage, recycling, or sale of Respondent's wastes). Also provide each individual's job title, duties, dates performing those duties, supervisors for those duties, current position or the date of the individual's resignation, and the nature of the information possessed by such individuals concerning Respondent's waste management.

Response:

Under current policy, almost all employees at every level have some responsibility for complying with Siltronic's processes, policies and procedures for the proper handling of chemicals, including waste. For an example, the waste responsibility table (Beg Doc 0146673) lists management level personnel responsible for wastes.

Environmental responsibilities were managed as an engineering function under the Facilities Engineering Department from 1980 until 1991. Facilities Engineering managed all support equipment and utilities needed to support manufacturing activities at the site. Environmental

equipment including piping and drainage systems, wastewater treatment facilities, air pollution control devices, boiler and steam generation, compressed air systems, HVAC and clean room air supply, chillers, chemical storage systems, emergency power backup systems and support building were included as support functions under the Facilities Engineering Department. Each of these systems were assigned out to Facilities Engineers. The Facilities Engineering Department reported to the Director of Engineering along with several other engineering departments and maintenance groups. In 1991 an Environmental Engineering Department was created and was managed by the Environmental Engineering Manager. From 1980 until present operational responsibility for environmental equipment was and is the responsibility of Facilities Operations Department. Maintenance of environmental equipment was and is the responsibility of Facilities Maintenance Department. Facilities Operations and Facilities Maintenance report under the Facilities Engineering Department and indirectly to the Director of Engineering.

Director of Engineering

John Pittman	1979-1998
Cathryn Young	1998-2004
Larry Buzan	2005-Present

Facilities Engineering Manager

James Ellis	1979-1983
Ram Waney	1984-1984
Jerry Schaeffer	1985-1996
Ken Kemper	1996-2000
Tom Cates	2000-2002
Nick Frederick	2004-2007
Moe Khorsandian	2007-present

Facilities Engineers (who appeared to have been assigned the majority of environmental equipment)

Dirk Dunning	1980-?
Steve Beiswenger	1980-1999
Greg Carr	1982-1988
Richard Gariepy	1988-1991
Greg Deeney	1985-1993
Craig Driggs	1994-2000
Tim Kirk	1996-2003
John Thome	2001-2004
Barry Kelly	2004-Present

Facilities Operations Supervisors

Murray Tilson	1985-1986

Jerry Linden	1986-1995
George Stevens	1995-1996
Justin Darr	1996-Present

Environmental Engineering Manager

Murray Tilson	1986-1989
Tom McCue	1991-Present

Information possessed: (summary) information on Environmental Management Systems, information on technical problems experienced and solutions developed by the company to reduce impact on the environment and to comply with all relevant laws, regulations and standards in plant operations, general information on environmental compliance, planning and budgeting, related new technology, implementation of standards for environmental management systems, health and safety, current and historic site activity, including the nature of manufacturing operations in Oregon as it relates to long-term environmental planning.

A. Environmental Engineers (responsible for waste storage times and shipments)

Myron Burr	Mike Sutton
Koreen Lail	Chip Bloomer
Petra Hoy	Eric Spiering
Jim Claxton	Sandra Archer
Susan Mulholland	Kent Mayer

Job Description (summary) Provide engineering support, program development, project management, and technical support to effectuate the corporate objective of reducing impact on the environment while ensuring compliance with all laws related to environmental protection and hazardous waste. Lower grade environmental engineers assist in building and maintaining and Environmental Management system and provide support and technical skills to higher grade environmental engineers.

Reporting History:

Environmental Engineers reported to the Environmental Engineering Manager from 1991-Present

B. Facilities Manager

Job Description (summary) Ensures facilities serves to continuously support business units and service groups. Daily management and leadership for Facilities Operations, Facilities Maintenance, Facilities Engineering and Facilities Maintenance Engineering. Coordinates development of project management, maintenance scheduling and recordkeeping, construction and site development.

Reporting history: Cathryn Young, Director of Engineering, 1997 to 2004
John Pittman, Director of Engineering, 1980-1996

Information possessed: (summary) Information on site development and facilities management, maintenance, and operations.

Facilities Engineers

The facilities engineers had some responsibility for environmental issues prior to the creation of the Environmental Manager position, and reported to the Facilities Engineering

Job Description: Engineer, Facilities (summary) Provide prompt response to engineering work orders, resolve problems to ensure reliability of systems, coordinate engineering design and construction. Plans, controls and executes solutions to complex engineering problems and documents maintenance and procedures. Lower grade facilities engineers prepare proposals and funding requests, and assist higher grade facilities engineers.

Reporting History:

Facilities Engineering Manager
Information possessed: (summary) facilities engineers have knowledge of problems and solutions encountered in creating and maintaining systems, and in particular the engineering design and maintenance of such systems.

Facilities Operations Supervisors (responsible for treatment)

Job Description:
(Supervisor, Facilities Operations/Environmental) (summary) Assure plant support operations are met and comply with all state and federal permits. Work with engineering to design, improve and repair systems. Supervise environmental engineering technicians and facilities chemist. Oversee operations of the waste water treatment plant. Manage support equipment operations, such as boilers, chillers, vacuum pumps, cooling systems, and air compressors.
Reporting History:
Reports to:
Facilities Engineering Manager.

Information possessed:
Information concerning operations of the waste water treatment plant and related equipment.

D. Emergency Response Team Members

A spreadsheet with the names of ERT captains and members has been produced for the time period of 1998 through April 2008. Records older than 1998 were not located, with the exception that an original ERT report form and organizational chart was located from startup of operations in

1980 (See SCOEPA00117885-SCOEPA00117886).

Job Description (summary): Emergency Response Team (ERT) Members assist in providing emergency response services to the entire facility. Emergencies include, but are not limited to, the following: acute illness and/or injury of personnel; hazardous material releases; plant alarms and evacuations; firefighting (early-stage); confined-space rescue; and any other plant emergency. ERT Members perform response duties as assigned by following established protocols, procedures, and policies while maintaining compliance with local, state and federal standards and regulations. Members are encouraged to provide input on appropriateness of all response activities and may change, modify, suspend, or terminate actions based on considerations for personnel safety, environmental protection, and/or potential for property or product damage.

Reporting history: ERT Members report to the on-duty ERT Captains during emergencies and perform work under moderate supervision. Responsibilities of ERT Members are in addition to an employee's regular position at the company. All ERT personnel are on-call whenever on-shift.

Information possessed: The individual ERT member(s) responding to an emergency would have firsthand knowledge of that particular incident, and prepare incident reports on any emergency for which a response was required.

39. For each type of waste describe Respondent's contracts, agreements, or other arrangements for its disposal, treatment, or recycling.

Response:

The processes for qualifying and purchasing services from vendors that have a direct impact on environmental performance at Siltronic are outlined in the Procedure P-27.10.02/0005 Environmental Vendor Qualification. See SCOEPA00115584-SCOEPA00115590. It is the purchasing department's responsibility to review the approved environmental vendor list and to notify the environmental manger of any new vendors that require environmental evaluation and approval. The new vendors are evaluated, and if necessary audited, by the Environmental Department.

The environmental affairs department may choose to use the "TSDF Audit Package" or the "Recycling Audit Package" as a tool in the vendor evaluation. The audit package is in the form of a questionnaire. The questionnaire takes a holistic approach and it is likely that not every question in the list will be applicable for every environmental vendor. The environmental department may also choose to audit the vendor's site to gather additional information, before and/or after vendor approval. Once the evaluation is complete, the Environmental Manager authorizes new vendors to be placed on the environmental approved vendor list.

The environmental vendor is required to perform services for Siltronic in a safe and workmanlike manner, and in compliance with all statutes, ordinances, laws, orders, rules and regulations applicable to their services. The environmental vendor is responsible for completion of associated documentation, manifests, profiles, and shipping documents. The vendor is also responsible for labeling, transportation, and disposal (or recycling) in compliance to all regulatory requirements. All environmental vendors are required to maintain accurate books and records of products and services provided to Siltronic in sufficient detail to enable confirmation of supplier's compliance with Siltronic' purchase agreement. Additionally, all environmental vendors are required to have liability insurance. See SCOEPA00118044-SCOEPA00118054

Hazardous waste vendors are also required to provide a yearend waste report summary for the annual submission to DEQ. They are responsible to ensure that ultimate disposal is at a Siltronic approved Licensed Class l-A secure chemical landfill, incinerator, or chemical treatment facility. Hazardous waste vendors are also responsible to make certain that the signed manifest is returned from the TSDF within 45 days. .

Prior to transport, wastes are prepared according to the Environmental Guidance Procedure *P-27.10.02/0004*. However, if Siltronic's waste materials do not conform to the descriptions and specifications stated in the corresponding profile sheet, the environmental vendor and Siltronic shall in good faith attempt to amend the profile sheet and other pertinent documentation and/or correct any improper containerization, marking, or labeling to enable the vendor to accept such non-conforming waste materials at a facility. If the parties cannot within a reasonable time after vendor notifies Siltronic that the waste materials are non-conforming then Siltronic will make prompt arrangements for the removal of such non-conforming waste materials from the facility where they are located to another lawful place of storage or disposal. See SCOEPA00115482-SCOEPA00115535.

The purchasing department produces, updates, and stores the Environmental Services Purchasing Agreements. These agreements are governed by procedure P-16.30.02/0001 Purchase Order Authorization, Review, Data Requirements, Amendments to Contracts, Blank Orders Procedure. See SCOEPA00118055-SCOEPA00118065.

40. Provide copies of such contracts and other documents reflecting such agreements or arrangements:

    a. state where Respondent sent each type of its waste for disposal, treatment, or recycling;
    b. identify all entities and individuals who picked up waste from Respondent or who otherwise transported the waste away from Respondent's operations (these companies and individuals shall be called "Waste Carriers" for purposes of this Information Request);
    c. if Respondent transported any of its wastes away from its operations, please so indicate;
    d. for each type of waste specify which Waste Carrier picked it up;
    e. indicate the ultimate disposal/recycling/treatment location for each type of waste;

f. provide all documents indicating the ultimate disposal/recycling/treatment location for each type of waste; and
g. state the basis for and provide any documents supporting the answer to the previous question.

Response:

Hazardous and non-hazardous wastes are characterized by an Environmental Engineer using a checklist based on Oregon DEQ waste characterization training and guidelines. Once the checklist is complete and analysis requirements fulfilled, a profile is developed and the material is added to the Listed Wastes/Characteristic Waste Table and/or to the Waste Determination and Characterization notebook. See SCOEPA00065367-SCOEPA00065368. Completed hazardous and universal waste profiles are currently being sent for approval to either Veolia Environmental Services or to Burlington Environmental Services (PSE). Profiles for non-hazardous materials are sent to Waste Management (Hillsboro Landfill), Emerald Environmental Services, and Univar for approval as needed. See SCOEPA00065369-for past environmental waste carriers.

An Environmental Engineer schedules the shipments of hazardous, non-hazardous, and universal waste by the approved environmental waste carriers. See Environmental Vendor Qualification Procedure 27.10.02/0005 SCOEPA00115584-SCOEPA00115590. The Environmental Engineer also reviews and approves manifests, labels, etc. After the shipment has been completed, the manifests are entered into the waste shipment database. The manifests and LDR's are retained permanently as per SCO Records Procedure, *P-09.99.02/0015*. See hazardous waste manifests and non-hazardous waste invoices/bills of lading provided with this submittal.

The table below lists the approved non-hazardous waste carriers and the destination of the recycled/reclaimed/reused waste. Shipments of materials for recycling, i.e. paper and packing materials, are scheduled by the Clean Operations department to the approved environmental waste carriers listed in the procedure above.

RECYCLE / REUSE / RECLAIM VENDOR LIST

MATERIAL	Container Type / Waste Carrier	WHERE IT GOES	VENDOR	CONTACT
Solid Waste	40-yd Auger container / Vendor	Local transfer station (landfill)	Gresham Sanitary Service PO Box 1560 97030 2131 NW Birdsdale Gresham, OR 97030 greshamsanitary.com	Rep: Larry Head. Phone: 503-665-2424 Fax: 503-666-0917
Scrap Wood	40-yd dropbox / Vendor	Recycled w/ Pacific Land Clearing		
Glass Bottles	90-gal rollcan / Vendor	Recycled		
Scrap Quartz	20-yd covered dropbox / Vendor	Recycled- send to Cali company to be turned into lawn rocks		
Scrap Graphite	20-yd covered dropbox / Vendor	Hillsboro landfill		
Paper (all types)	Rollcans / Vendor	Recycled	Smurfit Recycling 427 Main St. Oregon City, OR 97045	Rep: Ryan Rasmussen Office: 772-8700
Cardboard (OCC)	Baled / Vendor			
Metal (all types)	30-yd dropbox(steel) , (5) 4x6 boxes / Vendor	Recycled	Quantum Resource Recovery 10750 SW Denney Rd. Beaverton, OR 97075	Rep: Mike Ingalls Dispatch: 646-2427
Plastic Film (PE)	Baled / Vendor	Recycled - turned into plastic/wood house siding product	Denton Plastics 4427 NE 158th Ave. Portland, OR 97230	Rep: Dan Hoyer Dispatch: 257-9945 Coord: Bob Decker
Plastic Drums & 5 Gallon Containers	Covered trailer / Vendor	Recycled - turned into plastic pellets		
Wood Pallets	Stacked outside / Vendor	Reused inside Univar's warehouse and here on-site	Univar 3950 NW Yeon Ave Portland OR 97210	Rick Staehle 503 222-6245
Styrofoam Peanuts	Large plastic bags stored in grey tent / Vendor	Reused	Carton Service 2211 NW Front Ave. Portland, OR 97209	Office: 227-6428
Toner Cartridges	Designated containers inside / Vendor	Reused	Corporate Express 13909 NE Airport Way Portland, OR 97230	Acct Mgr: Barbara Rocha Office: 261-2227 or cc:Mail
Aluminum Cans Plastic Bottles	Wooden box near auger / Vendor Arranged	Recycled	Cans For Kids (Donated)	Rep: Ted Damon Office: 274-4341
Tosoh Boxes	Stored in grey recycle tent / NA	Reused	Tosoh Quartz 14380 NW Science Park Dr Portland OR 97229	Rep: Roxanne Office: 605-5736
Thermocouples	Boxed / Common Carrier	Recycled	BASF Catayliist 46820 Fremont Blvd Fremont CA	Lousia 1800 490 2150
Spent Wire Saw Slurry (Silicon Carbide, and Polyethylene Glycol)	1000 Liter Plastic Tote / Vendor Arranged Carrier	Recycled	SIC Processing 6949 N Cutter Circle Portland 97217	Rep: Damen Doelger, Office# 503 285-3500 ext 101
Chemical Drums Reused by Suppliers	Used Chemical Drums / Vendor	Reused	Univar 3950 NW Yeon Ave Portland OR 97210	Rick Staehle 503 222-6245
Gas Cylinders Reused by Suppliers	Gas Cylinders / Vendor	Reused	Linde 4715 NE 78th Street Vancouver, WA. 98665	Dave Menke (360) 992-5295
Gas Cylinders Reused by Suppliers	Gas Cylinders / Vendor	Reused	Air Liquide 10450 SW Tualatin-Sherwood Road, Sherwood, OR 97062	Mark Finerson (503) 454-1203
Nickel Cadmium, Lithium, Nickel Metal Hydride batteries	Cardboard box / UPS	Recycled	Inmetco RBRC One Inmetco Drive Ellwoood City, PA 16117 6299	Manager of Recycling Activities 678-419-9990
Mercury	Metal Flask / Vendor Arranged Carrier	Recycled	Mercury Waste Solutions LLC 21211 Durand Ave Union Grove, WI 53182-9711	Rep: Justine Bryant 1800 741-3343

Hazardous waste generation and management statistics are reported annually via the annual Hazardous Waste Report submitted to the Oregon Department of Environmental Quality and included in this submittal. This report includes:

- all entities who picked up hazardous waste and transported it away
- where each type of waste went for disposal or treatment
- the wastes ultimate disposal/treatment location

Annual reports are available from 1991 to 2007. Quarterly and biannual hazardous waste reports are available for the years 1980-1991. All available hazardous waste reports are included with this submittal. Additionally, some wastes are reported to the Environmental Protection Agency via the Toxic Release Inventory (TRI). TRI reports are included with this submittal.

Siltronic's purchasing department located numerous contracts and purchase orders dating back to

1995. Some services were done as direct vendors (without a PO or contract). See the Direct Vendor Payment Summaries, SCOEPA00118066-SCOEPA00118071. There is some microfilm of older Purchase Orders (1983 - 1994) located on site. Such information will be made available on request but was not reviewed in preparing this response.

Contracts and Purchase Orders are included in the documents produced in response to this request.

41. Describe all wastes disposed by Respondent into Respondent's drains including but not limited to:

a. the nature and chemical composition of each type of waste;
b. the dates on which those wastes were disposed;
c. the approximate quantity of those wastes disposed by month and year;
d. the location to which these wastes drained (e.g. septic system or storage tank at the Property, pre- treatment plant, Publicly Owned Treatment Works (POTW), etc.); and
e. whether and what pretreatment was provided.

Response:

The majority of wastes produced at Siltronic are liquid wastes. Original factory design included waste segregation to optimize waste treatment. A separated drain system was constructed to direct liquid wastes to an onsite waste water treatment plant or to storage tanks for off-site shipment or treatment. Inorganic waste water was treated onsite to remove all contaminants required by DEQ and discharged to the Willamette River under an NPDES permit issued by Oregon DEQ. Chromic acid has been treated both onsite and offsite. It is currently shipped offsite to a TSDF for treatment. Organic waste water containing surfactants and biological oxygen demand (BOD) containing polishing and process chemicals is pre-treated and discharged under an industrial pre-treatment permit issued by the City of Portland. Waste from early uses of solvents including TCE, Freon, etc. were collected in a separated drain system (Solvent Organic Drain – SOD

Tougher cleaning specifications for modern silicon wafer products combined with waste minimization and chemical use reduction programs have driven manufacturing processes to rely on aqueous based processes using ultrapure water as the primary cleaning solvent. TCE, Freons have been eliminated. Chromic waste has been reduced by 99%. Water use has increased but chemical use is down. See also the response to Question 63 regarding disposal to subsurface systems and drains.

a. Chemicals Permitted in the Drain Systems

The tables included in this section list the type of systems, drains and the treatment method associated with each drain. This table is posted by each sink in the process areas. Each new employee is instructed in the workings of drain systems and the importance of segregating waste material into the proper drain.

Drain locations are posted with the following notice:

Note: Employees are instructed to consult the WWTP Operator at ext. 7302 or by radio channel #3 if they have any questions regarding waste drains.

Process Building Drain Collection System and Treatment Methods		
System	**Description**	**Generally Permitted Chemicals**
CAD/ CAED (Fab 2 only)	Concentrated Acid Drain	Hydrofluoric (HF) Nitric acid (HNO_3) Hydrochloric acid (HCl) Sulfuric acid (H_2SO_4)
WAD	Weak Acid Drain	Sodium hydroxide (NaOH) Hydrochloric acid (HCl) Nitric acid (HNO_3) Hydrochloric acid (HCl) Sulfuric acid (H_2SO_4)
CCD	Concentrated Caustic Drain	Sodium hydroxide (NaOH), Potassium hydroxide (KOH)
OWW	Organic Waste Water	Surfactant, detergents, wetting agents, glycol, polishing slurries, ammonium hydroxide, TMAH (TetraMethyl Ammonium Hydroxide), TEA (TriEthanolAmine), potassium carbonate, citric acid, acetic acid Dilute: acetone, ethyl alcohol, isopropyl alcohol, hydrogen peroxide
SWW SSW	Silicon Solids Waste Water	Silicon grinding waste, silicon carbide, Lutensol, aluminum oxide
BD	Blow Down	Cooling water, city water
D	Domestic (Sanitary Waste Water)	Kitchen sinks, restrooms, general water fountains.
CAW	Chromic Acid Drain	Chromic acid, chromium trioxide, potassium dichromate

Note: This table does not contain all the chemicals used at this plant.

In addition to the above drain list is the Solvent Organic Drain (SOD) system. The SOD system was installed in 1979 and became operational at plant startup in 1980. The SOD consisted of three drain systems. Each drain was connected to an underground storage tank.

SOD-W was a waste TCE drain system from wax formulation and wax mounting and waste TCE from polishing plate preparation and cleaning.

SOD-R was a recycled TCE drain system collected TCE from a tab removal and cleaning process. SOD-R was recycled and returned to the process.

SOD-T was a waste water drain system that contained rinse water with a trace amount of TCE. SOD-T wastewater was treated in an onsite stripper to remove the TCE.

b. Drains were used to collect and segregate liquid wastes since startup of operation in 1980 until the present. The major changes include the re-engineering of the wafer cleaning and wax mounting operations which allowed the elimination of the use of chlorinated solvents (TCE and Freons) in the late 1980's and early 1990's. After all chlorinated solvents were removed from processes the SOD (Solvent Organic Drain) system was decommissioned. Chlorinated solvents were replaced by aqueous cleaning methods and equipment changes. Increased use of water for cleaning required more water use, an expansion of ultra pure water plants and wastewater treatment facilities.

c. Records are not available for all years. Records of waste water treatment flows by treatment system are kept for three years then discarded. NPDES discharge monitoring reports are provided as a part of this submittal and document total treated waste water and non-contact water discharged on a monthly basis. Annual Hazardous Waste Activity Reports are provided as a part of this submittal and document RCRA Exempt waste water treated by major system totalized annually. Hazardous Waste Manifests are provided as a part of this submittal and document liquid chromic waste water shipments for offsite treatment. Such documents are included in the electronic submittal associated with this response.

d, e. Drain system description, treatment method and discharge point Table.

Drain Collection System and Treatment Methods

The following table lists the types of drain systems, the treatment given to each waste system, and its discharge point.

System	Description	Treatment	Discharge Point
CAD / CAED	Concentrated Acid Drain	• Neutralization • Fluoride precipitation	Willamette River
WAD	Weak Acid Drain	Neutralization	Willamette River
CCD	Concentrated Caustic Drain	Used for neutralization	• Willamette River • City of Portland
OWW	Organic Waste	Neutralization	City of Portland

System	Description	Treatment	Discharge Point
North Sump and SSW	Silicon Solid Wastewater	Neutralization	City of Portland
BD	Blow Down	Mixes with combined effluent	Willamette River
D	Domestic	None	City of Portland
CAW	Chromic Acid Waste Drain	None	Chromic Acid waste solution shipped off-site as hazardous waste
Fab 2 SWW	• Silicon solids • Waste water	Neutralization	Willamette River

e. In addition to the table (d) above SOD drain systems were connected to storage tanks for onsite treatment or offsite recycle or disposal.

SOD-W (sometimes referred to as SOD-H) collected waste TCE from process and was sent off-site for recycle.

SOD-R collected TCE from cleaning processes and was recycled onsite for some period of time and then offsite.

SOD-T collected wastewater containing trace amounts of TCE and Freons were treated onsite in a stripper column to remove the TCE and Freon. Treated wastewater was released to the sanitary sewer under NPDES pre-treatment permit. Still bottoms were containerized and shipped as hazardous waste for incineration.

Freon waste was containerized for offsite recycle or incineration and TCE still bottoms from a stripper column were containerized for offsite incineration.

42. Identify any sewage authority or treatment works to which Respondent's waste was sent.

Response:
Sewage has been discharged to one sewage authority or treatment works since start up of operations in 1980. Two waste streams are discharged to the city sewer. They include:

1. Domestic sewer from rest rooms, kitchens and lunch rooms, and
2. Organic waste water (OWW Drain) and rinse water containing surfactants, organic compounds, or compounds likely to contribute to biological oxygen demand.

The OWW discharge is subject to a wastewater discharge permit issued by:

City of Portland Environmental Services
Industrial Source Control Division
6543 N. Burlington, Ave.
Portland, Oregon 97203-5452
(503) 823-5600

The discharge permit is an industrial pre-treatment permit.

Permit number:	469.001
Expiration Date:	3-20-2011
Permit Contact:	Brian Laurent

43. Describe all settling tank, septic system, or pretreatment system sludges or other treatment wastes resulting from Respondent's operations. Provide specific information identifying the practice of tar settling in ponds near and/or in parts of Doane Lake.

Response:

With respect to tar settling in ponds near and/or in parts of Doane Lake, please refer to the CSM SS (SDMS 1210617) and updates in the LWG Round 2 Report; also the Siltronic RI Report (SDMS 1258448). In short, PG&C (predecessor to NW Natural) generated a wide variety of liquid waste including tar (i.e., oily waste with a specific gravity greater than water) and oil (i.e., oily waste with a specific gravity less than water) from oil gasification. Prior to approximately 1940, waste was discharged directly to the Willamette River.

After approximately 1940, waste was directed to a series of unlined settling ponds and an overflow lagoon, encompassing approximately 10 acres, primarily on property later sold by PG&C and controlled by owners and operators (see response to Questions 10, 11) that preceded Siltronic's ownership. Based on the amount of feedstock reported by Northwest Natural, the gasification operations generated between 1 to 10 acre-feet of waste (to the settling ponds) per year between 1940 and 1956, when oil gasification ceased. Excess waste from the settling ponds and/or other operations was also discharged directly to the river.

With respect to Siltronic's operations, treatment system waste as settled solids are generated from slicing and mechanical shaping of silicon, treatment of fluoride containing wastewater, and sediment collected in stormwater catch basins or stormwater line cleanout.

Silicon wafer mechanical manufacturing processes include cutting silicon ingot into thin slices either by diamond saw or multi-wire saw operations. Silicon ingots are attached to a graphite bar for mounting into the saws. After slicing, wafers are rinsed, the residual graphite tab is removed, wafers are lapped with aluminum oxide, and edges are rounded by

grinding a radius on the circumferential edge. Rinse water containing solids from these operations are directed to a settling sump (North Sump) for primary settling. Settled solids collected in the sump are removed approximately monthly and disposed as special solid waste under permit no. 6950. Wastewater from the North Sump is pumped to the organic wastewater (OWW) forwarding sump. Solids build up slowly in the OWW sump. The OWW forwarding sump is cleaned out approximately annually and the solids are disposed of as solid waste under the same permit. Analysis of the silicon solids and the permit are included in the responsive documents..

Solids build up in the base of saws used for the slicing operations. Slicing sludge consists of silicon particles, graphite particles, silicon carbide, and glycol residue. Graphite tabs build up in the tab removal step. Graphite tabs and slicing sludge is removed periodically and are disposed as a special solid waste under permit no. 167. A copy of the permit and analysis is included in the responsive documents.

Wastewater from wafer etching contains HNO_3 and HF and dissolved silicon. The acidic wastewater is neutralized with lime, and settled with anionic polymers and alum. Treatment sludge from the precipitation of calcium fluoride is dewatered by a filter press and disposed in a landfill as a solid waste under permit no. 6843. A copy of the permit and analysis is included in the responsive documents..

The stormwater collection system is designed to collect solids and oil and grease to prevent run-off from reaching the river. Catch basins are pumped out twice per year and the solids are disposed as solid wastes under permit no.7153. In 2007 a main stormwater line was cleaned out and disposed as solid waste under the same permit. Analysis is performed annually to renew the disposal permit. The line cleanout was a non-routine event and more extensive analysis was performed. A copy of the permit and both sets of analysis are included in the responsive documents.

44. If applicable, describe the facilities, processes and methods Respondent or Respondent's contractor used, and activities engaged in, either currently or in the past, related to ship building, retrofitting, maintenance or repair, including, but not limited to, dry-docking operations, tank cleaning, painting and re-powering.

Response:

Not applicable. Siltronic does not know of any current or historic activity related to ship building, retrofitting, maintenance or repair, including, but not limited to, dry-docking operations, tank cleaning, painting and re-powering.

45. Describe any hazardous substances, wastes, or materials used or generated by the activities described in response to the previous Question and how these hazardous substances, materials and wastes were released or disposed of.

Response:

Not applicable. See response to question 44.

46. Provide copies of any records you have in your possession, custody or control relative to the activities described in response to the previous two Questions.

Response:

Siltronic has no records of any ship building, retrofitting, maintenance or repair, dry-docking operations, tank cleaning, painting and re-powering, and has no reason to believe that these activities occur or have historically occurred at the property.

47. Describe any process or activity conducted on a Property identified in response to Question 4 involving the acquisition, manufacture, use, storage, handling, disposal or release or threatened release of polychlorinated biphenyl(s) ("PCB(s)" or PCB(s)-containing materials or liquids.

Response:

Siltronic Engineering searched for records related to all oil filled electrical transformers, high voltage switch gear, capacitors, and lighting ballasts. To the best of our knowledge no other potentially PCB (greater than 500 PPM) or PCB contaminated (greater than 50 PPM) materials are believed to have been on the property while under Siltronic ownership. The first plant wide oil analysis for Siltronic owned electrical distribution transformers is the 1989 SD Meyers report.

<u>PGE Electrical Substation Transformers and HV Switch Gear – Non-PCB</u>
Portland General Electric has provided a letter dated March 1, 2007 confirming that all transformers and Load Tap Changers located within the Wacker (Siltronic) Substation are "Non-PCB" by EPA classification. This includes transformers which were removed during an upgrade to the substation in 1995. See Beg Doc 0140598-0140599.

<u>Siltronic Owned Electrical Distribution Transformers – Non-PCB</u>
All Siltronic owned distribution transformers are "Non-PCB" by EPA classification. Transformer oil analyses, including PCB data, are available for 1989 and 1993, then for alternating years from 1993 through 2003, and for each and every year from 2003 through 2007. Transformer PCB analyses data were not found for years prior to 1989. See 1989 SD Meyers Transformer Reports parts 1-4, (SCOEPA00065450-SCOEPA00065453); 1993 SD Meyers Transformer Reports, parts 1-3 (SCOEPA00065464-SCOEPA00065497), and 2007 SD Meyers Transformer Reports, parts 1-4, (SCOEPA00065498-SCOEPA00065541).

The 1993 SD Meyers report lists "NO DATA" for one transformer, TC# 15. A Subsequent analysis for this transformer was reported to have been completed but could not be located. This transformer is not in service and is excluded from later reports. Siltronic performed a follow-up oil analysis for TC# 15 in April, 2008 which confirms "Non-PCB" classification. See SCOEPA00065552.

The 2007 SD Meyers report lists several transformers as "NO DATA". These transformers were installed since 1995 and are confirmed by the manufacturer to be "Non-PCB". Therefore they were not tested for PCBs.

Power Factor Capacitors – Non PCB

Siltronic currently has 53 power factor correction capacitors in service on the site. All are either labeled "Non-PCB or were installed new since 1988 and are therefore assumed to be "Non-PCB". Siltronic records indicate that eight power factor correction capacitors have been removed from service. All of these capacitors were either labeled "Non-PCB" or were installed new since 1991 and therefore assumed to be "Non-PCB". All removed capacitors were disposed of as hazardous waste. Engineering does not have a copy of the disposal certificates. For an inventory of all PF correction capacitors see SCOEPA00065545-SCOEPA00065546.

Other Capacitors and Electrical Equipment – PCB Containing

Siltronic currently has one piece of equipment on site, RF Outbake Furnace, which contains 5 oil filled capacitors which likely contain PCBs. The equipment has been idle since December 2003 and is slated for removal and disposal. There is no evidence that these capacitors have leaked.

In 1992, Siltronic disposed of three x-ray transformer carcasses and 20 gallons of oil analyzed @ < 1ppm PCB, along with 18 small capacitors analyzed @ < 1ppm PCB. Disposal records are included in the responsive documents.

In 1989 Siltronic disposed of one x-ray transformer containing approximately 40 gallons of oil analyzed @ 11ppm PCBs. Disposal records are available included in the responsive documents.

Fluorescent Lighting Ballasts – PCB Containing

Some fluorescent lighting fixtures installed during the 1978 construction of Fab 1 and the Administration building included ballast transformers that contained PCBs.

In 1998 Siltronic contracted with Christenson Electric to upgrade lighting fixtures in the Administration Building. All ballast transformers were replaced during this upgrade. Ballast transformers containing PCBs were disposed of as hazardous waste by the contractor. Siltronic no longer has records related to this project or the disposal of the ballast transformers.

In September 2000, Siltronic contracted with Christenson Electric to upgrade lighting in most areas of the Fab 1 Manufacturing building. The work was completed by January 2001. During the upgrade 197 ballast transformers containing PCBs were removed and disposed of as hazardous waste. See SCOEPA00065542-SCOEPA00065544and SCOEPA00065549-SCOEPA00065551.

Fluorescent lighting fixtures in the Fab 1 Lapping area, room # C112, were not replaced during the 2000 lighting upgrade and some are assumed to contain PCBs. There are 46 fixtures in service in this area.

Individual lighting ballasts containing PCBs may have been replaced as part of routine maintenance. Siltronic does not consistently have records concerning such individual replacement,

but may have some anectodotal records in recycling manifests. See SCOEPA0044233.

48. For each process or activity identified in response to the previous Question, describe the dates and duration of the activity or process and the quantity and type of PCB(s) or PCB(s) containing materials or liquids.

Response:

Date Installed	Date Removed	Type	Quantity	Location
1978	NA	Fluorescent lighting ballasts	46 ballasts, possible PCB containing	Fab1, room C-112
1978	1998	Fluorescent lighting ballasts	Number of Ballasts Unknown	Administration Building
1978	2000	Fluorescent lighting ballasts	197 ballasts	Fab 1, original 1978 construction, excluding room C-112
1978	NA	Capacitors, likely containing PCBs	5 Capacitors, approx. 1 liter each.	RF Outbake machine, Fab 1, room A103
Unknown	1987	PCB Contaminated Capacitors	30 lbs;	Unknown
Unknown	1989	X-ray transformer	40 gallons @ 11ppm PCB	Fab 1, room unknown
Unknown	1992	18 capacitors	Small size @ < 1ppm PCB	Fab 1, room unknown
Unknown	1992	3 X-ray transformers and one drum of oil	20 gallons @ < 1ppm PCB	Fab 1, room unknown

49. For each process or activity identified in response to the previous two Questions, identify the location of the process or activity on the Property.

Response:

Locations are included in the table in the response to Question 48.

Section 5.0 Regulatory Information

50. Identify all federal, state and local authorities that regulated the owner or operator of each Property and/or that interacted with the owner or operator of each Property. Your response is to address all interactions and in particular all contacts from agencies/departments that dealt with health and safety issues and environmental concerns.

Response:

Each agency that has regulated Siltronic is identified below, with notes on the scope of records being produced in response to the question. The most accurate description of each interaction can

be assessed by reviewing those records, and the individual interactions reflected in the documents produced in response to this question. Any additional information known to Siltronic on an agency interaction is discussed below.

United States' Agencies:

Environmental Protection Agency

US EPA TSCA inspection March 31, 1993. Inspector Danial D. Heister, EPA, Oregon Operations. Selected Siltronic as a designated facility due to a past shipment of electrical equipment. Section 11 of TSCA. Reviewed all transformer analysis records. Inspected all capacitors in the building. Follow up discussion with Bill Hedgebeth EPA Region X, Seattle.

US EPA Chemical Safety Audit January 25-29, 1993. Inspectors Patrick J. Lowery – EPA, Thomas D. Madigan and Scott M. Smith – EPA contractors from Resource Applications, Inc. The inspection authority was given as SARA under CERCLA. Purpose of the audit was to review all chemical related activities on the site and identify best practices. Enforcement, if required, would be referred to another group within EPA. The audit was unannounced and conducted over five days by two teams. A technical team consisted of two chemical engineers and reviewed all chemical uses, processes, handling, dispensing, storage, pollution controls and waste management. The administrative team focused on regulatory compliance and records review, prevention, preparedness, purchasing, executive strategy and policy, chemical safety training, and emergency response including coordination with local responders. Siltronic was found to be the best facility inspected to date in the four year old program.

US EPA Hazardous Material DOT compliance inspection, Spring 1993. Inspection of all hazardous and non-hazardous materials, containers, labels and shipping papers related to purchase, storage, and shipment activities. The inspection found an error on the label of fresh product. Siltronic was required to contact the manufacturer and inform them of the labeling error and request it to be corrected. The chemical manufacturer was contacted and so notified. No further follow-up was required.

US EPA CAA RMP submittals for HF and Hydrogen bulk storage systems

US EPA CAA Large boiler NSPS Notification

US EPA SARA Title III, Form R Toxic Release Inventory SARA 313 submittals annually

US EPA RCRA Generator registration

Department of Homeland Security

Under a relatively new regulatory scheme, the Department of Homeland Security enforces Chemical Facility Anti-Terrorism Standards (CFATS), application of Chemical Security Assessment Tool and potentially requiring a Security Vulnerability Assessment or an Alternative Security Program.

United States Customs and Border Protection
US Customs may request information on imports. See SCOEPA00118224-SCOEPA00118228 .

Oregon State Agencies:

Oregon Department of Environmental Quality, Northwest Region

Northwest Region of DEQ issues all of the permits necessary for operation of pollution control equipment and systems installed by Siltronic except for the discharge of industrial wastewater to the POTW. Each permit includes performance standards, inspections, monitoring and reporting requirements. In the case of Hazardous Waste, Siltronic is registered as a large quantity generator and does not hold a TSDF permit. A summary of permits and reports follows.

Water Quality Division NPDES Permits and DMR and annual reporting,
NPDES Stormwater Permit and annual reports Permit inspector is Elliot Zais
Air Quality Division Air Contaminant Discharge Permit and annual report
Hazardous Waste Division Hazardous Waste Activity Report

Oregon Division of State Lands

Outfall easement across state lands

Oregon Water Resources Board

Monitoring well registration
Underground injection permit for bioremediation pilot testing activities

OR-OSHA:

The Siltronic Health & Safety department regularly interacts with OR-OSHA (the Oregon Occupational Safety and Health Administration). From 1997 through 2005 assessments were completed by this agency approximately annually as part of Siltronic's participation in the State of Oregon's Safety and Health Achievement Recognition Program (SHARP). SHARP is a voluntary program that partners Oregon employers with OR-OSHA's consultative services branch in an effort to assist employers in the development of outstanding health and safety management systems. Siltronic graduated from this program in 2005.

Additional Consultative services have been provided by this agency at the request of Siltronic Corporation. These include the following:

- 1989 – Industrial Hygiene Monitoring, employee exposure to solvents.
- 1992 - Scaffolding
- April 1996 – Lockout/Tagout
- July 1996 – Bulk Acid Transfer

Compliance inspections have been made by this agency based on a State determined auditing schedule (no specific period between audits) and employee complaints. All available documentation associated with compliance inspections has been provided for the years 1995-present (see question 51 for additional details).

More complete records may be available through the Oregon Department of Consumer and Business Services Occupational Safety and Health Division regarding services provided to Siltronic Corporation for dates prior to 1995.

Oregon State Fire Marshal

The Hazardous Material Fire Inspector performs an audit every three years. Siltronic has 10 buildings and each one is inspected for compliance to code. Reports are issued, stating what needs to be corrected (if something was found) and Siltronic then provides evidence to the Fire Marshal that documents performance of the corrections. The records of fire inspections that Siltronic has are produced in response to this question. Every year the State Fire Marshal sends out a reporting system, the Hazardous Substance Information Survey (HSIS) which is to be completed by H&S. This survey is required by Oregon law and compiles information about the chemicals stored and used at Siltronic. Only chemicals that meet the threshold need be reported.

Oregon DHS, Radiation Protection Services

The Oregon Department of Human Services, Radiation Protection Services. Siltronic is annually inspected by a Health Physicist to verify safety compliance with respect to x-ray machines. Every three years the Radiation Protection Services sends a inspector to conduct a audit. The reports of these inspections are produced in response to this question.

State of California

Hazardous Materials Shipment registration

City of Portland- Local Agencies

Portland Bureau of Environmental Services, NPDES Industrial Pre-treatment permit and monthly discharge reports and by-annual reporting

Portland Fire Bureau

The City of Portland Fire Bureau has periodic inspections for fire hazards and code violations.

51. Describe all occurrences associated with violations, citations, deficiencies, and/or accidents concerning each Property during the period being investigated related to health and safety issues and/or environmental concerns. Provide copies of all documents associated with each occurrence described.

Response:

Siltronic understands that this question need only describe those occurrences relating to environmental concerns or health and safety concerns with environmental implications. Any violation or citations/occurrences that have occurred on site are contained in the OR-OSHA, Portland Fire Bureau and DHS Radiation protection records produced in response to Question 50, above. Siltronic retains these records on site for approximately the past 5 – 10 years. Records are produced and are included in the documents referenced to this response. The records produced in general include the following, which describe violations or deficiencies:

Accident investigation records, OSHA reports and workers compensation claim forms have also been provided, but only to the extent that such incident reports relate to chemical exposures or spills. Other OSHA and workers compensation records are available but not produced in response to this question.

Accident investigation records from 1991 to 2008 have been provided as part of this request, where the accident could be considered related to an environmental issue. Incident investigation records prior to 1997 may be incomplete.

OSHA inspection records are intermixed with OHSA letters of interpretation, consultation records and SHARP records. Siltronic has records of this type going back as far as 1989 (not all years are represented as inspections do not occur on a set schedule). These include the following:

- February 1995 – Safety audit (machine guarding, housekeeping, lockout/tagout, cranes, etc).
- March 1995 – Safety audit (confined space).
- April 1996 – Complaint (lifting of polishing plates)
- December 1997 – Complaint (light bulbs bursting)
- April 1999 – Safety Audit (machine guarding, eyewash stations, electrical)
- April 1999 – Health Audit – (chemical labeling, detection, storage and exhaust, confined space labeling, respirator storage, eyewashes)
- September 1999 – Complaint (Barrel Pickers)
- August 2000 – Complaint (ASM Reactor)
- January 2001 – Complaint (Centura reactor fire)
- January 2007 – Complaint (Epi Ergonomics)
- February 2008 – Health & PSM Audit

Records dated prior to 1995 may be incomplete. More complete records may be available through the Oregon Department of Consumer and Business Services Occupational Safety and Health Division.
OSHA log reports contain a brief summary of workplace accidents and illness that have occurred at Siltronic. These reports have been provided for the years 1980-1983 and 1985-present. An OSHA log for 1984 could not be located.

Some Worker Compensation Claim forms have been provided as part of the above mentioned accident investigations. In addition, claim forms for all workers compensation claims filed by Siltronic employees from 1980 to present are separately maintained in each

employee's Siltronic medical record stored either onsite at Siltronic or at various offsite storage locations. The claim forms located in employee medical records are not easily separated from other private medical information. As such, due to the strict confidentiality of information contained in these records and the need to comply with HIPAA regulations regarding the release of medical information, claim forms contained in employee medical records have not been produced at this time.

Fire Marshal inspections generally are code related- fire doors not operating properly or closing properly, placards/labels not present, extinguishers, emergency lights, hazardous materials storage, exit or egress rules. Findings from previous audits have all been very minor and any code violations are typically corrected within days of the inspection.

Radiation Services inspections are specific to our x-ray machines. They include training, labeling, emissions, and interlocks. Our x-ray machines are very low power and previous deficiencies have been due to labeling and warning indicators which were minor code violations.

The Health & Safety Department has electronic records dealing with ERT and security reports going back to about 2000. A database is available for examination. Most ERT calls are not chemical or chemical related. Life safety system and medical issues make up the bulk of the ERT Reports. Prior years were documented via paper copy and these records are no longer available. Information is generally name, date, what the response was, how it was cleaned up or disposed of.

The Health & Safety Department has paper records dealing with the Fire Department and the Radiation Department going back several years in their office area.

Occurrences of Environmental Notice of Violations

11/14/85 City of Portland issued a letter citing violations of industrial Waste Permit No. 469-01 between September 6, 1985 and October 14, 1985 when discharge to the POTW was out of compliance for TCE (SCOEPA00032880-SCOEPA00032881). Additional documentation identified specific dates when violations occurred: August 9; September 6; September 27, and October 2 (SCOEPA00032878-SCOEPA00032879).

8/2/1988 Hazardous Waste generator inspection by Oregon DEQ, NWR found deficiencies in Contingency Plan, HW Label date issue, Manifest waste code error and, failure to include Chrome sludge from wastewater treatment unit in HW total generation report

2/7/1990 Oregon DEQ, NWR Water Quality Division issued a notice of violation for NPDES monthly monitoring permit exceedances of the Fluoride and TSS permit limits

5/4/1990 Oregon DEQ, NWR Water Quality Division issued an NOV for monthly monitoring report permit exceedance of the TSS permit limit

4/13/1992 Oregon DEQ, NWR Water Quality Division issued an NOV for monthly monitoring report permit exceedance of the TSS permit limit

9/13/1993 Oregon DEQ, NWR Water Quality Division issued an NOV for monthly monitoring report permit exceedance of the TSS permit limit

1/29/1996 Oregon DEQ, NWR Air Quality permit inspection resulted in an NOV for failure to meet testing requirement in permit #26-3002

2/28/1996 Oregon DEQ, NWR Air Quality Division issued an NOV for late submittal of testing report, permit #26-3002

9/9/1996 Siltronic self reported missing mercury containers from the 90-day hazardous waste storage area during a weekly inspection. An investigation began immediately. No evidence of the mercury shipment as a hazardous waste. Solid waste wipes and personal protective equipment (gloves, plastic) was shipped from the HW storage area. A possible pathway was that the small mercury containers were double bagged with absorbent materials around the mercury containers and was mistaken for solid waste. An immediate search of the Metro Solid Waste Transfer station in NW Portland was conducted without success. Oregon DEQ Hazardous Waste Division issued a Class 1 violation failure to prepare manifest.

4/29/1998 Siltronic self reported a failure of software to on a data acquisition system supporting a continuous monitoring station attached to a NOx air pollution control scrubber. NO air emission exceedance occurred. A paper strip chart was used as a backup to the electronic data acquisition system. During the repairs the strip chart ran out of paper and several days of data were lost before it was noticed. Oregon Air Quality NWR issued and NOV for failure to meet monitoring requirements for a continuous emission monitoring system.

5/24/1999 Oregon DEQ, NWR Hazardous Waste inspection resulted in issuance of an NOV for chrome treatment operations. Chromic acid is reduced to chromium hydroxide and precipitated within a wastewater treatment unit. The treated wastewater is tested and if treatment is complete transferred to the main WWTP for additional treatment. The precipitated chrome sludge was drained into a steel drum and the water content was evaporated by heating the contained sludge with an electric drum heater under an exhaust hood. DEQ cited failure to perform HW determination on liquid sludge after removal from a "wastewater treatment unit" and before dewatering step.

52. Provide a list of all local, state and federal environmental permits ever issued to the owner or operator on each Property (e.g., RCRA permits, National Pollutant Discharge Elimination System (NPDES) permits, etc.). Please provide a copy of each federal and state permit, and the applications for each permit, ever issued to the owner or operator on each Property.

Response:

The table below lists all the environmental permits issued to Siltronic. Siltronic construes this

question to not seek the same information described in questions 50 and 51. Therefore, documents associated with the OR-OSHA, Portland Fire Bureau, and Oregon DHS Radiation Protection Services investigations—some of which involve or describe permits but which permits are not necessarily "environmental"—are produced with the records of inspections in response to those questions and not repeated here.

Environmental Permits – SCO

Permit Name	Number	Issuing Agency	Expiration Date	Permit Status
Air Contaminant Discharge Permit	26-3002	Oregon Department of Environmental Quality	1-Jan-2011	Active
Indirect Source Construction Permit	26-8020	Oregon Department of Environmental Quality	Permanent	Active
Hazardous Waste Generator Registration	ORD096253737	US Environmental Protection Agency	Permanent	Active
Outfall Easement	37182-EA	Oregon Department of State Lands	18-Dec-2036	Active
State Lands Temporary Use Permit (River Sediment Investigation)	33191-LI	Oregon Department of State Lands	1-Aug-2010	Active
National Pollutant Discharge Elimination System Wastewater Discharge Permit	101128	Oregon Department of Environmental Quality	30-Apr-2009	Active
National Pollutant Discharge Elimination System Stormwater Discharge Permit 1200Z	1200-Z	Oregon Department of Environmental Quality	1-Jul-2012	Active
Industrial Wastewater Pretreatment Wastewater Discharge Permit	469.001	City of Portland Environmental Services	20-Mar-2011	Active
Special solid waste disposal permit	6950	Hillsboro Landfill, Inc.	11-May-2007	
Non-Hazardous Materials Disposal Permit	6843	Hillsboro Landfill, Inc.	14-Jul-2008	Active
Non-Hazardous Materials Disposal Permit	7153	Hillsboro Landfill, Inc.	18-Nov-2008	Active
Non-Hazardous Materials Disposal Permit	167	Hillsboro Landfill, Inc.	18-Nov-2008	Active

Underground Injection Control Registration (Bioremediation)	12775-1	Oregon Department of Environmental Quality	Not applicable	Active
Underground Injection Control Registration (Bioremediation)	12775-2	Oregon Department of Environmental Quality	Not applicable	Active
Outfall Modification Permit	071-OYA-2-003092	Dept. of the Army Corp of Engineers	15-Jul-1979	Inactive
Removal/Fill Permit	2990	Oregon Division of State Lands	9-Nov-1978	Inactive
National Pollutant Discharge Elimination System Storm Water Permit	1200L	Oregon Department of Environmental Quality	24-Sep-1991	Inactive
National Pollutant Discharge Elimination System Construction Storm Water Permit	1200C	Oregon Department of Environmental Quality	25-Sep-1991	Inactive

53. Did the owner or operator ever file a Hazardous Waste Activity Notification under the RCRA? If so, provide a copy of such notification.

Response: Yes. The RCRA Part A application as a generator of hazardous waste and as a treatment facility for the neutralization of corrosive wastes in tanks was submitted on November 19, 1980 (SCOEPA00072976-SCOEPA00072986) On July 21, 1981 Linda Dawson, EPA Program Development Section advised that the treatment of corrosive wastes in tanks may be exempt from permit requirements. Regulatory guidance dated July 31, 1981 (SCOEPA00082857-SCOEPA00082890) clarified the requirements for a WWTU exclusion from RCRA permitting. Telephone notes from Linda Dawson on Sept. 3, 1981 (SCOEPA00082893-SCOEPA00082896) recommend withdrawal of the treatment application. EPA letter from Linda Dawson dated November 27, 1981 clarifies the 90 day storage allowance and the elementary asks Wacker Siltronic to notify EPA if a RCRA permit is required. Wacker Siltronic notified EPA on December 21, 1981 that a RCRA permit did not appear to be needed and requested to withdraw the permit application. See SCOEPA00124900 – SCOEPA00124907 for the series of correspondence.

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54. Did the owner or operator's facility on each Property ever have "interim status" under the RCRA? If so, and the facility does not currently have interim status; describe the circumstances under which the facility lost interim status.

Response: Yes. Records suggest Siltronic filed for interim status for the waste chromic acid treatment system. The application was withdrawn after clarification that the chromic acid treatment system was exempt from regulation under RCRA and met the definition of a “wastewater treatment unit” regulated under the CWA and is addressed within the

NPDES permit for the facility.

55. Provide all RCRA Identification Numbers issued to Respondent by EPA or a state for Respondent's operations.

Response: Siltronic has been issued one RCRA ID Number. ORD 096253737

56. Identify all federal offices to which Respondent has sent or filed hazardous substance or hazardous waste information. State the years during which such information was sent/filed.

Response:

Below is a list of the federal offices to which there has been sent or filed hazardous substance or hazardous waste information. The agency and their respective addresses are arranged according to topic. These addresses are the ones that were used at the time of submission. Documents pertaining to specific agency contacts are produced in response to question 50.

National Performance Track Program

U.S. Environmental Protection Agency
The Performance Track Information Center
c/o Industrial Economics Incorporated
4th Floor, 2067 Massachusetts Ave.
Cambridge, MA 02140
www.epa.gov/performancetrack

P-Track Annual performance Report
Years 2001 through 2007

Clean Air Act

U.S. Environmental Protection Agency
Region 10, 1200 Sixth Ave.
Seattle WA 98101
NSPS Boiler Semiannual Fuel Use Report
Years 2006 through 2008.

U.S. Environmental Protection Agency
Region 10, M/S At-082
1200 Sixth Avenue
Seattle, WA 98101
Notification of NSPS Equipment Startup

Year 1996

U.S. Environmental Protection Agency
RMP Reporting Center
c/o Computer Based systems, Inc., Suite 300
4600 North Fairfax Drive
Arlington, VA 22203
Risk Management Plan
Year 1999

U.S. Environmental Protection Agency
Risk Management Plan (RMP) Reporting Center
P.O. Box 1515
Lanham-Seabrook, Maryland 20703
Risk Management Plan
Year 2002 and 2004

U.S. Coast Guard
Jonathan Shipperely
Fax 503-240-9308
Risk Management Plan
Year 2001

Director FBI
RMP Program – Room 1B327
935 Pennsylvania Ave. NW
Washington, DC 20535
Risk Management Plan
Year 2000

Emergency Planning Community Right to Know

U.S. Environmental Protection Agency
TRI Data Processing Center
P.O. Box 1513
Lanham, MD 20703
Toxic Release Inventory
Years 1987 through 2007

Hazardous Waste

Regional Administrator
EPA Region 10
M/S 530-A
1200 Sixth Ave.
Seattle, WA 98101

RCRA Permit Application/Treatment Facility
Year 1980

57. Identify all state offices to which Respondent has sent or filed hazardous substance or hazardous waste information. State the years during which such information was sent/filed.

Response:

Documents pertaining to specific agency contacts are produced in response to question 50.

Office of State Fire Marshal
4760 Portland Road, NE
Salem. Oregon 97305
Hazardous Substance Information Survey
Reporting Years 1986-2007

Health & Safety completes the Hazardous Substance Information Survey. Files are kept for three years. Previous copies are destroyed- we are required to keep three years on file (reference SCO records retention policy).

A Cesium source (Cs-137) was used in the Fab 1 wet blast bench as a method to measure the density of the wet blasting agent. The cesium source itself was removed from site between March and August 2004. . Documentation of the permit for removal of this source and acceptance of ownership and transfer is produced in response to this question.SeeSCOEPA00081046 through SCOEPA00081063..

Oregon Department of Environmental Quality

Hazardous Waste Activity Report
Oregon Department of Environmental Quality
Northwest Region
2020 SW Fourth Ave., Suite 400
Portland, OR
Reporting years: 1980-2007

Toxic Use Reduction Hazardous Waste Reduction Report
Oregon Department of Environmental Quality
811 SW Sixth Ave.
Portland, Oregon 97204
Reporting Years 1989-2005

58. List all federal and state environmental laws and regulations under which Respondent has reported to federal or state governments, including but not limited to: Toxic Substances Control Act, 15 U.S.C. Sections 2601 et seq., (TSCA); Emergency Planning and Community Right-to-Know Act, 42 U.S.C. Sections 1101 et seq., (EPCRA); and the Clean

Water Act (the Water Pollution Prevention and Control Act), 33 U.S.C. Sections 1251 et seq., Oregon Hazardous Substance Remedial Action Law, ORS 465.315, Oregon Water Quality law, ORS Chapter 468(b), Oregon Hazardous Waste and Hazardous Materials law, ORS Chapters 465 and 46.6, or Oregon Solid Waste law, ORS Chapter 459. Provide copies of each report made, or if only oral reporting was required, identify the federal and state offices to which such report was made.

Response:

- Clean Air Act (CAA) and CAA Amendments of 1990
- Water Pollution Control Act as amended by the Clean Water Act (CWA) of 1977
- Resource Conservation and Recovery Act (RCRA)
- Comprehensive Environmental Response Compensation and Liability Act (CERCLA)
- Emergency Planning and Community Right-to-Know Act (EPCRA)
- Toxic Substance Control Act (TSCA)
- Hazardous Materials Transportation Act (HMTA) of 1974 as amended

U.S. Federal Environmental Regulations:

CERCLA/EPCRA Title	*Location*
• EPA designation, reportable quantities, and notification requirements	40 CFR 302
• EPA regulations for emergency planning and notification	40 CFR 355
• EPA hazardous chemical reporting and community right-to-know	40 CFR 370
• EPA toxic chemical release reporting regulations	40 CFR 372
AIR	
• EPA regulations on primary and secondary National Ambient Air Quality	40 CFR 50
• EPA regulations on National Emissions Standards for Hazardous Air	40 CFR 61
• EPA regulations on NESHAPs for source categories	40 CFR 63
• EPA regulations on state operating permit programs	40 CFR 70
• EPA regulations on permits	40 CFR 72
• Stratospheric ozone protection regulations	40 CFR 82
WATER	
• EPA regulations on discharge of oil	40 CFR 110
• EPA regulations on oil pollution prevention	40 CFR 112
• EPA regulations on designation of hazardous substances	40 CFR 116
• EPA regulations on determination of reportable quantities for	40 CFR 117
• EPA National Pollutant Discharge Elimination System (NPDES)	40 CFR 122
• NPDES regulations	40 CFR 125
• EPA toxic pollutant effluent standards	40 CFR 129
• EPA general provisions for effluent guidelines and standards	40 CFR 401
• Pretreatment standard	40 CFR 403
• Wastewater discharge limitations	40 CFR 469
SOLID AND HAZARDOUS WASTE	
• EPA general regulations for hazardous waste management	40 CFR 260
• EPA regulations for identifying hazardous waste	40 CFR 261

- EPA regulations for hazardous waste generators 40 CFR 262
- EPA regulations for lead-acid battery recycle 40 CFR 266
- EPA regulations on land disposal restrictions 40 CFR 268
- EPA standards for universal waste management 40 CFR 273
- EPA standards for managing used oil 40 CFR 279

OTHER

- EPA Guidelines Establishing Test Procedures for 40 CFR 136
- EPA Hazardous Materials Handling and Transportation 40 CFR 172
- EPA /DOT transportation of hazardous substances 49 CFR 172

State of Oregon Department of Environmental Quality Statutes and Rules

- Oregon pollution control tax credits OAR 340-016
- Oregon general emission standards for particulate matter OAR 340-021
- Oregon general gaseous emissions OAR 340-022
- Oregon control of ozone depleting chemicals OAR 340-022
- Oregon air pollution emergencies OAR 340-027
- Oregon stationary source air pollution control and permitting procedures OAR 340-028
- Oregon air pollution control standards for air purity and quality OAR 340-031
- Oregon hazardous air pollutants OAR 340-032
- Oregon noise control regulations OAR 340-035
- Oregon groundwater quality protection OAR 340-040
- Oregon water pollution OAR 340-041
- Oregon regulations pertaining to NPDES permits OAR 340-045
- Oregon regulations pertaining to oil spills in public waters OAR 340-047
- Oregon certification of compliance with water quality requirements and standards OAR 340-048
- Oregon hazardous waste management system, general OAR 340-100
- Oregon standards applicable to generators of hazardous waste OAR 340-102
- Oregon spills and other incidents OAR 340-108
- Oregon used oil management rules OAR 340-111
- Oregon universal waste regulations OAR 340-113
- Oregon toxics use reduction and hazardous waste reduction regulations OAR 340-135
- Oregon solid waste management statute ORS 459
- Oregon reuse and recycling ORS 459a
- Oregon hazardous waste and hazardous materials I ORS 465
- Oregon hazardous waste and hazardous materials II ORS 466
- Oregon air quality ORS 468a
- Oregon water quality ORS 468b

Other:

- Bureau of Environmental Services Administrative Rules
- Chapter 17.34 of the City of Portland Code
- Responsible Care

Documentation of reports, including notes and memos of any oral reports, are also produced as documentation of all agency contacts in response to Question 50.

59. Provide a copy of any registrations, notifications, inspections or reports required by the Toxic Substances Control Act, 15 USC ' 2601 et seq., or state law, to be maintained or submitted to any government agency, including fire marshals), relating to PCB(s) or PCB(s) containing materials or liquids on any Property identified in response to Question 4.

Response:
No PCB containing (greater than 500 PPM PCB) or PCB contaminated (greater than 50 PPM PCB) equipment has been installed or used at the site. Equipment with less than regulated amounts of PCB materials have been managed conservatively for disposal purposes.

In March 1989, a Non-regulated PCB transformer containing approximately 40 gallons of liquid at 11PPM PCB was arranged for decommissioning and disposal by GE Industry Sales and Services PCB Division. An analysis record of a floor wipe sample found 2.05 ug. Aroclor 1260. SCOEPA00065845-SCOEPA00065846.

In June 1992, one drum of Non-regulated waste oil containing < 1 PPM PCB and 18 small capacitors were shipped to General Electric Company PCB Decommissioning Facility, Portland, Oregon. HW Manifest 22624, GE Tracking # 22624, SCOEPA00065847-SCOEPA00065849.

US EPA TSCA inspection March 31, 1993. Inspector Daniel D. Heister, EPA, Oregon Operations. Selected Siltronic as a designated facility due to a past shipment of electrical equipment. Section 11 of TSCA. Reviewed all transformer analysis records. Inspected all capacitors in the building. Follow up discussion with Bill Hedgebeth EPA Region X, Seattle.
A copy of oil analysis from each transformer was provided to the EPA inspector. SCOEPA00065850-SCOEPA00065863 . No leaks were observed. All oil filled transformers are installed within secondary containment systems and are connected to oil/water separators to prevent a release. One small transformer was associated with an out-bake furnace did not have a label. A sample of the oil was taken May 14, 1993. Analysis received May 19, 1993 found 9 ug/L Aroclor 1254/60 and was classified as Non-PCB. SCOEPA00065864-SCOEPA00065865 . A copy of the oil analysis was sent to the EPA inspector. EPA's TSCA inspection of March 31, 1993 confirmed that all transformers and capacitors were in compliance with PCB regulations.SCOEPA00065642,

60. Has Respondent or Respondent's contractors, lessees, tenants, or agents ever contacted,

provided notice to, or made a report to the Oregon .Department of State Lands ("DSL") or any other state agency concerning an incident, accident, spill, release, or other event involving Respondent's leased state aquatic lands? If so, describe each incident, accident, spill, release, or other event and provide copies of all communications between Respondent or its agents and DSL or the. other state agency and all documents that were exchanged between Respondent, its agents and DSL or other state agency.

Response: Siltronic does not have leased state aquatic lands. However, because Siltronic has an easement with the Department of State Lands, Siltronic is answering the question with respect to that area.

An easement exists for installation, operation and maintenance or replacement of an outfall discharge pipe. See response to Question 7 describing that easement. DSL also provided an access agreement (temporary use permit) to Siltronic for certain in-river environmental investigations See response to Question 61 regarding that access agreement.

High water and flood conditions in 1996 caused extensive damage to rip-rap and river bank stabilization including the area where the easement is located. A bank repair project was completed in 1998 by Advanced American Diving Service, Inc. Approximately 2,000 feet of riverbank was involved. Repairs included removal and disposal of logs and debris deposited by high water conditions. Stabilization of the sloped bank included placement of geotextile erosion control material and bank armament with 1,000# and 500# rip-rap.

On July 29, 1998 Advanced American Diving was dredging silt from the Willamette River to backfill behind newly placed rip-rap rock. Apparently a deposit of oily material is the sediment was disturbed resulting in an unknown quantity of oily material and a visible sheen on the river. Oil booms and absorbent pads were immediately deployed by AADS to control and contain the oil.

Approximately two clamshell buckets of river sediment was placed on the bank. The sediments were black and oily and contaminated a section of the bank near the river and some of the new rocks. The Oregon Emergency Response System was called to report the incident. Incident number 98-17-92 was assigned. US Coast Guard was contacted by DEQ and Officer John Murphy and two others came to the site and verified the situation was under control. The entire incident was then reported to the EPA NRC and assigned case number 448107.

Cleanup included removal of soil, sediments and rock contaminated by the oily sediments. Oil booms and absorbent pads and PPE were managed by placement in lined drop boxes along with the other cleanup materials. TCLP and TPH analysis was performed. Records show a total of 9 drop boxes were sent to Oregon Waste Systems, Inc. Columbia Ridge Landfill and Recycling Center. Relevant records are included in the documents produced in response to this request.

61. Describe all notice or reporting requirements to DSL that you had under an aquatic lands lease or state law or regulation regarding incidents affecting, or activities or operations

occurring on leased aquatic lands. Include the nature of the matter required to be reported and the office or official to whom the notice or report went to. Provide copies of all such notices or reports.

Response:

Siltronic was granted an access agreement by DSL in order to conduct in-river investigation activities related to the TCE plume. The access agreement provides that Siltronic is "required to notify the State of Oregon not less than five working days before initiating Work on the Property. Siltronic is also required to provide the State with copies of all work plans (and other documents describing the nature and location of the Work), validated analytical data generated by the work, and all final reports summarizing such analytical data as soon as practicable."

Consistent with the requirements of the access agreement, MFA provided notice that in-river work was commencing in September, 2004, and again in May, 2005. Consistent with the requirements of the access agreement, MFA provided copies of the RI Report (which incorporated the results of the in-river work) to the State (including DSL and DEQ). This document and previous in-river data submittals which were submitted in support of the RI work are included in response to question 71.

Section 6.0 Releases and Remediation

62. Identify all leaks, spills, or releases into the environment of any waste, including petroleum, hazardous substances, pollutants, or contaminants, that have occurred at or from each Property, which includes any aquatic lands owned or leased by Respondent In addition, identify and provide copies of any documents regarding:

    a. when such releases occurred;
    b. how the releases occurred (e.g. when the substances were being stored, delivered by a vendor, transported or transferred (to or from any tanks, drums, barrels, or recovery units), and treated);
    c. the amount of each hazardous substances, pollutants, or contaminants so released;
    d. where such releases occurred;
    e. any and all activities undertaken in response to each such release or threatened release, including the notification of any agencies or governmental units about the release;
    f. any and all investigations of the circumstances, nature, extent or location of each release or threatened release including, the results of any soil, water (ground and surface), or air testing undertaken; and
    g. provide any information or documentation which address questions (a) through (f)for the following:
        i. an oil spill found in two excavations adjacent to the Koppers Company property line;
        ii. contamination of dioxin-tainted herbicide between 1960 and 1975;
        iii. discharges of coal tar to the water or soil; and
        iv. any other releases of dioxin-tainted herbicide to the soil or groundwater.

Response:

Data in response to subparts (a) through (f) is included in the table on the following page. Regarding subpart (g), data collected by Siltronic in response to the TCE Order has suggested or confirmed that the releases specified in subparts (g)(i) through (g)(iv) have occurred, but Siltronic has no other documents related to these incidents to support a response to the questions in (a) through (f).

In general, documentation of any type of spill or release is produced in response to this question, even where the spill or release was controlled and addressed prior to any release to the environment.

Release Info	Date of Release	How Occurred	Amount	Location	Response	Investigations	Documents
Siltronic - chromic acid	12/26/1983	Dilute chromic acid release to waste water system and Willamette River	approximately 10 pounds of 2.0 ppm chromic acid	WWTP; Outfall	No documented action taken	None	Multiple; see electronic documents coded to this question.
Siltronic - Nitric acid	8/3/1983	Uncontrolled release of dilute nitric acid/hydrofluoric acid from WWTP to Willamette River via NPDES outfall	Approximately 45 gallons of 65% acid mixture mixed with 120,000 gallons of treated water	WWTP; Outfall	No documented action taken	None	Multiple; see electronic documents coded to this question.
Siltronic - chromic acid	12/21/1983	Dilute chromic acid release to waste water system and Willamette River	approximately 1.5 pounds of 1.5 ppm chromic acid	WWTP; Outfall	No documented action taken	None	Multiple; see electronic documents coded to this question.
Siltronic - neutralized chromic acid	5/28/1984	Dilute chromic acid release to waste water system and Willamette River	approximately 3.7 pounds of neutralized chromic acid, 1.2 ppm hex chrome content; mixed with approximately 250,000 gallons of water	WWTP; Outfall	No documented action taken	None	Multiple; see electronic documents coded to this question.
Siltronic – bank repair	1998	Release of MGP-impacted sediments and sheens to the Willamette River	Unknown	Offshore of Siltronic	Booms deployed	None	Multiple; see electronic documents coded to this question.

Release Info	Date of Release	How Occurred	Amount	Location	Response	Investigations	Documents
Siltronic – TCE - Interior	6/30/1986	Release of TCE from tab removal to organic waste water (OWW) sump and potentially to City of Portland POTW	Estimated approximately 1 pint	Interior of building	Informed City of Portland	None	SCOEPA00032872-SCOEPA00032875; SCOEPA00032870-SCOEPA00032871
Siltronic – TCE - Interior	5/18/1987	Release from TCE wax makeup tank to floor drain, OWW sump, and potentially to City of Portland POTW	Estimated approximately 1-2 pints	Interior of building	Informed City of Portland	None	SCOEPA00032866-SCOEPA00032869
Siltronic - TCE - Outdoor	12-3-1984; 12-31-1984	Release of TCE-containing wastewater to ground from recycling equipment; potentially to Willamette River via combined stormwater system and outfall	Unknown; estimates of total TCE released range from 11 to 25 gallons	Former TCE stripper	Soil in spill area overexcavated and removed; No Further Action determination by DEQ	Subsequent investigation in stripper area confirm soil cleaned up and no residual groundwater impacts.	Multiple; see electronic documents coded to this question, including for example SCOEPA00054903-SCOEPA00054945.
Siltronic - TCE Outdoor	11/6/1980	Release of TCE from SOD-W UST to ground due to pump failure; potentially to Willamette River via combined stormwater system and outfall	Unknown	Former TCE UST area	No documented action taken	None	Maintenance logs (SCOEPA00084246 to SCOEPA00084249)

Release Info	Date of Release	How Occurred	Amount	Location	Response	Investigations	Documents
MGP Waste from NW Natural predecessor operations	1940-1972 (approximately)	Direct disposal to open lagoons for liquids; solid wastes incorporated into fill.	Unknown; estimates range from 16 to 160 acre-feet of liquids, and tens of thousands of cubic yards of solid waste. Wastes included petroleum hydrocarbons, PAHs, metals, cyanide as liquid and solid waste.	Liquids disposed to northern portion of Siltronic property; solid wastes incorporated into fill throughout the property.	No documented action taken	Investigations of soil, groundwater, and indoor air have been ongoing since 2001	In addition to the electronic documents attached, documents submitted by NW Natural in response to the 104(e) request should provide additional information.
Koppers process water discharge	1966-1972	Direct disposal to land	Approximately 1,500 gallons per day of wastewater from coal tar distillation operations.	Discharged to Koppers leasehold area adjacent to or overlapping current Siltronic property line.	No documented action taken	Investigations of soil, groundwater, and indoor air have been ongoing since 2001	In addition to the electronic documents attached, documents submitted by NW Natural in response to the 104(e) request should provide additional information.
RPAC discharges	1943-1990?	Direct disposal to Doane Lake, and Willamette River via Outfall 22C and 22B; and migration of impacted groundwater from disposal	Unknown; spills or off-spec batch disposal occurred throughout plant operations; drums and other debris incorporated into Doane Lake fill.	Spill occurred on RPAC and BNSF properties; BNSF is adjacent to south property boundary of Siltronic.	No documented action taken	Investigations of soil, groundwater, and surface water have been ongoing since approximately 1990.	In addition to the electronic documents attached, documents submitted by SLLI in response to the 104(e) request should provide additional information.
Siltronic - TCE - Interior	21-Dec-83	Cleaning bath overflow of TCE to Silicon Waste Water (SWW) sump, and clarifier; possibly to Willamette River	Unknown; estimates range from approximately 25 to 120 gallons.	Unknown cleaning room	Flow from room drainage diverted to SOD-W tank and prevented from draining to clarifier	None	See documents provided with the response, including SCOEPA00035180-SCOEPA00035196.

63. Was there ever a spill, leak, release or discharge of waste, including petroleum, or hazardous substances, pollutant or contaminant into any subsurface disposal system or floor drain inside or under a building on the Property? If the answer to the preceding question is anything but an unqualified "no," identify and provide copies of any documents regarding:

a. where the disposal system or floor drains were located;
b. when the disposal system or floor drains were installed;
c. whether the disposal system or floor drains were connected to pipes;
d. where such pipes were located and emptied;
e. when such pipes were installed;
f. how and when such pipes were replaced, or repaired; and
g. whether such pipes ever leaked or in any way released such waste or hazardous substances into the environment.

Response:

63.a.-c.:
Siltronic disposal systems and drains are designed to accept and segregate waste water and chemicals from the process into separate piping systems for treatment. Floor drains in manufacturing and manufacturing support areas follow this same segregation strategy. Sanitary drains are only found in non-manufacturing areas. The drain systems are segregated as follows:

WAD – Weak Acid Drain
CAD – Concentrated Acid Drain
CAED – Concentrated Acid Etch Drain
OWW – Organic Waste Water
CCD – Concentrated Caustic Drain
SWW – Silicon Waste Water
SAN – Sanitary Sewer

As noted in the response to the previous question, several releases of TCE occurred in interior process rooms, which were managed through the OWW and SWW systems. Solvent drains (SOD-T, SOD-R, and SOD-C) are no longer in use and have been removed or remain intact but unused.

Since the early 1990s Siltronic has avoided the installation of subsurface piping wherever possible. In 1992/1993 Siltronic installed a containment vault for Fab 1 forwarding sumps and installed above ground containment for drain lines between Fab 1 and the waste water treat facility. Most of the drains and disposal systems in Fab 2 are installed in containment trenches and vaults. Fab 1 has a mix of subsurface drain pipes and pipes in containment trenches.

63d: The following are the primary Siltronic drawings that show the location of floor drains, under slab drain pipes, and underground drain pipes: 1M13, 1M14, 1M15, 2M342A, 2M342B, 2M469, 2M470, 2M857, 4W28, 5M47, 6M100, 6M101, 6M102, 6M103, 6M615, 6M616, and 6M618. See SCOEPA00124301-SCOEPA00124316through 147336. Additional reference drawings are available with Siltronic Engineering Documentation.

63 e, f, and g:

Siltronic searched engineering project folders related to repair or replacement of subsurface disposal systems, including floor drains or drain pipes under buildings or around the property.

Repair or replacement of subsurface disposal systems or floor drains at Siltronic has historically been contracted to third parties. Engineering project folders are created for all major work projects. A description of drain repairs and projects from engineering project folders is included below.

For smaller repairs that do not require engineering design services, purchase order requests are generated by Facilities Maintenance for the work. Siltronic searched for purchase orders to contractors who would have been hired to perform such work. Electronic purchase order records are available from 1997 through the present and are linked to maintenance work orders for work performed after 1998. Purchase Order records for 1983 through 1996 are available on microfilm as part of Purchasing Department Records and were not reviewed but are available. Purchase order records prior to 1983 are no longer available.

Siltronic also asked current employees who supervise Facilities Maintenance and Facilities Operations for their recollection of any repair or replacement of subsurface disposal systems or drains to verify that significant drain repair and replacement projects have been discovered in the records search described above.

The review of project folders, available purchase orders to contractors, and recollection by current employees found the following pipe and drain repairs:

Date Installed: 1978
Date Repaired/Replaced: Sept. – Nov. 1981; time frame approximate.
Description of Activities:

A leak of a corrosive substance occurred beneath the Hega 7.18 cleaning machine, which damaged three mild steel drain lines. The Hega 7.18 used a hot detergent. Siltronic excavated and repaired damaged under-slab drain piping located in Fab 1, around the intersection of column lines “15.5” and “E”. Pictures show damaged SOD-T, OWW, and SOD-R pipes below the floor, where they go up to the machine. A drawing dated 9/17/81, 2M120, “Drain System repair – Hega Mach’s” was used to establish a time frame for the repair. A maintenance technician recalls that the repair was performed by Hoffman Construction. No project folder was found related to this repair. Siltronic does not have purchase order records or maintenance work orders from this period.

Any Leak or Release:

A release of hazardous substances to the environment is probable based on the available evidence. The exact process used in the Hega 7.18 machine at the time is uncertain from the records. The machine used Freon, some type of detergent, and a solvent. Although a TCE drain pipe ran below the slab near this machine, the maintenance technician who worked in the area at that time does not believe that that TCE was actually used in this

machine.

Date Installed: 1984
Date Repaired/Replaced: 5/19/86
Description of Activities:

Sanitary floor drain in warehouse area backing up. Drain served bathrooms and janitor's sink in upstairs offices (I-209, I-210, I211). Gravel found in drain, caused by contractor damage to clean-out located just outside of building. Cleaned pipe replaced clean-out.

Any Leak or Release:

No evidence in the records of any release of hazardous substances to the environment.

Date Installed: 1978
Date Repaired/Replaced: 1985
Description of Activities:

Removal of underground storage tanks and piping for TCE.

Any Leak or Release:

None indicated based on visual inspection of the underground storage tanks and piping upon removal in 1985. Soil and groundwater sampling performed in 2003 indicated a release of TCE (amount unknown) occurred while tanks were in operation.

Date Installed: 1978
Date Repaired/Replaced: 7/23/89
Description of Activities:

Siltronic replaced approximately 100 ft of 4 inch and 6 inch, buried carbon steel Organic Waste Water (OWW) pipe in the south yard, located between column lines 15.5 and 19. Replacement was initiated by non-destructive testing that indicated thinning of old pipe. Replaced old pipe with new 6 inch polypropylene. During this project a section of abandoned SOD-R Solvent Drain, which was in the path of the work, was also removed back to Fab 1 room D-125. Prior to removal, the SOD-R pipe was found to contain liquid; during removal, construction logs indicate that liquid was present, but no release was documented. Thickness measurements on a section of the removed pipe indicate significant thinning along the bottom of the pipe and indicate the possibility of a release from pinholes or localized failure. An analysis of liquid in the SOD-R pipe found TCE and trace amounts of Freon TF and other solvents. Liquid in the SOD-R pipe was subsequently drained and captured prior to removal of the pipe.

Any Leak or Release:

No evidence in the records of any release of hazardous substances to the environment. No mention of any leak from the OWW pipe. No mention of soil contamination during removal of SOD-R pipe

Date Installed: 1978
Date Repaired/Replaced: Approximate, 1986 to 1992 - No Date for this repair
Description of Activities:

An employee (Justin Darr c/o Siltronic), recalls that a small sink hole developed in the asphalt road, in the south yard where underground drain pipes turn and go toward the Siltronic WWTP. He is not sure what drain line leaked, but it may have been the WAD.

Any Leak or Release:

It is probable that a leak occurred to the environment. No records of this suspected leak or repair were found in Engineering Documentation or Environmental Affairs records. No record was found in current purchase orders, back through 1997. Purchase orders for the period 1983 through 1996 are on microfilm, and are available but were not reviewed in preparing this response.. Purchase order records prior to 1983 are no longer available.

Date Installed: 1978
Date Repaired/Replaced: Approximate late 1980's- No Date for this repair
Description of Activities:

An employee (Justin Darr c/o Siltronic), found Polaroid photos in his office of what appears to be a repair of a drain pipe in the ground. Repair occurred in the south yard, near Fab 1, between column lines 15 and 16. Photos have notes pointing to a leaking flange on what is believed to be a CAD drain line.

Any Leak or Release:

It is probable that a leak occurred to the environment. No records of this suspected leak or repair were found in Engineering Documentation or Environmental Affairs records. No record was found in current purchase orders, back through 1997. Purchase orders for the period 1983 through 1996 are on microfilm and are available but were not reviewed in preparing this response. Purchase order records prior to 1983 are no longer available.

Date Installed: 1978
Date Repaired/Replaced: 1992/1993
Description of Activities:

Fab 1 Waste Water Treatment Plant Upgrade. Project included Removal of in-ground forwarding sumps for WAD, CAD, and CCD. Installed new forwarding sumps in containment vault. Re-piped drains from Fab 1 to new forwarding sumps. Installed new above ground lines in secondary containment from forwarding sumps to the WWTP. Abandoned in-ground drain pipes to WWTP.

Any Leak or Release:

No evidence in the records of any release of hazardous substances to the environment.

Date Installed: 1978
Date Repaired/Replaced: 1/16/2004
Description of Activities:

Concrete around floor drain in Fab 1, F-101 deteriorated by Ultra-Pure deionized water. Replaced floor drain with larger catch basin and resurfaced concrete in the area.

Any Leak or Release:

No evidence in the records of any release of hazardous substances to the environment.

Date Installed: 1978
Date Repaired/Replaced: 8/14/2006

Description of Activities:

Excavated and replaced plugged Concentrated Caustic Drain (CCD) pipe going to Meter Vault #1 at Waste Water Treatment plant.

Any Leak or Release:

No evidence in the records of any release of hazardous substances to the environment.

Date Installed: 1978
Date Repaired/Replaced: 2/28/2008
Description of Activities:

Domestic drain from Cafeteria sink and women's restroom sink not draining properly (Fab1, E-130 and E-131). Excavated and replaced approximately 4 ft. of collapsed pipe.

Any Leak or Release:

Domestic wash water only, no hazardous substances.

64. Has any contaminated soil ever been excavated or removed from the Property? Unless the answer to the preceding question is anything besides an unequivocal "no," identify and provide copies of any documents regarding:

a. amount of soil excavated;
b. location of excavation presented on a map or aerial photograph;
c. manner and place of disposal and/or storage of excavated soil;
d. dates of soil excavation;
e. identity of persons who excavated or removed the soil, if other than a contractor for Respondent;
f. reason for soil excavation;
g. whether the excavation or removed soil contained hazardous substances, pollutants or contaminants, including petroleum, what constituents the soil contained, and why the soil contained such constituents;
h. all analyses or tests and results of analyses of the soil that was removed from the Property;
i. all analyses or tests and results of analyses of the excavated area after the soil was removed from the Property;
j. all persons, including contractors, with information about (a) through (i) of this request; and
k. respond to (a) through (j) for response actions including but not limited to the following:
    i. the two excavations adjacent to the Koppers Company property line in which an oil spill was found in February 1979;
    ii. the removal of ten cubic yards of contaminated soil near the new Siltronic building built after 1990; and
    iii. any excavations of soil undertaken as part of a construction project on the Property during the period of Respondent's ownership.

Response: Fab 1 forwarding sump construction 1991, 1995, 1996 Fab 2 construction, 1998 Riverbank repair. In narrative, x reference hazardous waste manifests, treat & close report for SWMU

During the 1979 construction of wastewater treatment plant in the southwest corner of the property, petroleum contaminated soil was encountered in two areas during excavation. This was reported to DEQ, and guidance was requested. Free product was observed floating on top of groundwater accumulating in the bottom of the excavation. It was determined to be in an area where a pipeline owned by Olympic Pipeline entered the property. Olympic Pipeline was contacted. They responded and found a leak in one of the two buried pipes and replaced a section. Olympic Pipeline contractors excavated a new pit for oil water separation into which all available free product oil and groundwater was pumped. Anecdotal information indicates free product (oil) was skimmed off the top of the water in the separation pit and, placed into a tanker truck and taken for product recovery. Petroleum contaminated soils were said to have been placed back into the open excavation by Olympic Pipeline contractors. Siltronic has no record of quantity of soils if any, quantity of recovered oil, or debris removed and/or disposed at off site locations by Olympic Pipeline employees or contractors.

In1985 there was a soil removal response to a December 1984 TCE release from a wastewater stripper operation. Approximately 167.4 cubic yards of TCE contaminated soil was excavated and shipped to Chem Security Systems, Inc. in Arlington, Oregon as hazardous waste. Location of the TCE release was on the south side of the wafer manufacturing building (FAB1). Analytical results varied as the excavation continued until all soil greater than 1 mg/kg was removed. DEQ issued a No Further Action letter at the completion of the project. Contacts: Greg Carr, John Pittman.

In 1985 TCE contaminated sludge was removed from Organic Wastewater sump. 385 gallons of material was shipped in 7 drums to Chem Security Systems, Inc. The sludge contained 8500 mg/kg TCE. NOTE: This was NOT a soil removal project but is noted here as solids containing TCE were sent for disposal. Contacts: Greg Carr, John Pittman

In 1991 9.9 cubic yards of petroleum contaminated soil was removed from an excavation to install a wastewater sump along the south side of the wafer manufacturing building (FAB 1). Petroleum contaminated soil was encountered at approximately 17-19 feet below ground surface. Contaminated soils were classified as D018, containerized in a plastic lined roll-off box and shipped to Chemical Waste Management of the Northwest formerly Chem Security Systems, Inc. of Arlington, Oregon. Profile number J82851. Contacts: Tom McCue, Kent Mayer, John Pittman.

In 1991 two sections of approximately 2,000 feet each of Olympic Pipeline were replaced within the utility corridor crossing the middle portion of the Siltronic site east-west. Soil testing by Siltronic identified BTEX, PAH, and TPH compounds in soils, with the highest concentrations found directly above the Olympic Pipeline. This information was provided to DEQ and Olympic Pipeline. Upon testing by Olympic Pipeline, pipelines crossing Siltronic property failed to maintain pressure. Olympic Pipeline abandoned in place the existing pipelines and replaced two 2,000 ft sections with new pipe. It is not know if any petroleum contaminated soils or debris was removed from the site. Contact John Pittman, Tom McCue.
In 1995 one drum of oil contaminated gravel was removed and sent to Spencer, Inc. as non-hazardous waste for disposal. The oil contaminated gravel was generated by a failure of an oil/water coalescing filter connected to a large air compressor. Excess air pressure allowed oil contaminated water mist to be discharged out of a pressure relief valve resulting in a small soil

removal action to clean up oil stained gravel. No analysis was performed. Contact: Tom McCue, Spencer Environmental, Inc.

In 1995 Siltronic removed and treated onsite petroleum contaminated soils from the construction of FAB2 wafer manufacturing facilities. Petroleum contaminated soils were encountered during excavation activities for elevator shafts, stormwater system installation, fire water containment sump, wastewater forwarding sump construction, and city water connection projects. All potential petroleum contaminated soils were managed by conformance to pre-determined screening criteria and isolated from other non-impacted soils, placed into plastic lined roll-off boxes and tested for TCLP, BTEX, PAH, and TPH compounds. After accumulation of a number of roll-off boxes, onsite treatment options were discussed with Oregon DEQ. Soils that failed any of these tests were treated onsite by thermal desorption followed by incineration of volatilized VOC containing off-gasses. Soils were retested to meet state standards for landfill under a solid waste treatment letter of authorization issued by Oregon DEQ. DEQ authorized the creation of a temporary solid waste pile to stage impacted soils before treatment, thermal treatment, and specified performance standards. Additional soils with obvious petroleum impacts were treated first without further testing. All treated soils were tested to comply with landfill requirements and sold as cover material for the St. Johns landfill closure. For Treatment and Closure reports, see SCOEPA00037552-SCOEPA00037603, SCOEPA00037514-SCOEPA00037551. Contacts: include Tom McCue, Diane Irish, Chip Bloomer, and John Pitman.

The 1996 closure of the solid waste treatment area, which was constructed for thermal treatment of petroleum contaminated soils, generated 137.67 tons (approximately 120 cubic yards) of petroleum contaminated soils which were treated off-site by TPS Technologies Inc. Soils were treated by thermal desorption in the same manner as before but at a fixed location off-site facility. Treated soils were recycled. Contacts include Tom McCue, John Pittman, Diane Irish, Chip Bloomer, John Pittman.

In 1998 soil was removed from the riverbank during a repair project. During repair of rip-rap damaged by flooding in late 1996, Advanced American Diving disturbed petroleum contaminated sediments near shore and placed two calm-shell buckets of contaminated sediments onto Siltronic riverbank. A cleanup effort resulted in the generation of 5,491 tons of soil.

In July 2002, blow-down from the coalescent filters leaked oil from the venting system to the soil outside the Fab 1 compressor building. The oil contaminated soil was analyzed for diesel, hydrocarbons heavier than C24, o-Terphenyl (Surr.), TCLP Metals, and Extractable Organic Halogens (EOX). A total of 1,480 lbs of oil contaminated soil was removed by facility operations personnel. The soil was transported by Stratus Environmental Incorporated to TPST Soil Recyclers of Oregon for recycling.

In October 2002, a conduit threading machine operated by Christenson Electric leaked oil to the ground on the Siltronic campus. 14,600 pounds of oil contaminated soil was removed and analyzed for diesel, hydrocarbons heavier than C24, and o-Terphenyl (Surr.) See SCOEP 0085065 through SCOEPA0052076. Trashco Services transported the soil to TPST Soil Recyclers of Oregon for recycling.

65. Have you ever tested the groundwater under your Property? If so, please provide copies of all data, analysis, and reports generated from such testing.

Response:

Yes. Groundwater samples have been collected from monitoring wells and temporary points (over 100 locations to date) since 2002 for the purpose of investigating the nature and extent of TCE-related impacts. Electronic copies of analytical data reports are included in the electronic submittal for this question.

66. Have you treated, pumped, or taken any kind of response action on groundwater under your Property? Unless the answer to the preceding question is anything besides an unequivocal "no," identify and provide copies of any documents regarding:

a. reason for groundwater action;
b. whether the groundwater contained hazardous substances, pollutants or contaminants, including petroleum, what constituents the groundwater contained, and why the groundwater contained such constituents;
c. all analyses or tests and results of analyses of the groundwater;
d. if the groundwater action has been completed, describe the basis for ending the groundwater action; and
e. all persons, including contractors, with information about (a) through (c) of this request.

Response:

MFA, on Siltronic's behalf, implemented a pilot test of enhanced in-situ bioremediation (EIB) at the riverbank and in the former TCE UST area in 2006. These pilot studies have had a demonstrated benefit by reducing the concentrations of TCE and its degradation products in groundwater (i.e., "treating"), and to that extent may be considered a "response action" consistent with the question. However, the intent of the pilot study was to evaluate the feasibility of EIB for groundwater remediation.

MFA has implemented and performed the RI of TCE-related impacts in response to DEQ's Order Requiring Remedial Investigation and Source Control Measures (dated February 9, 2004). This work has not included groundwater treatment, pumping (other than for sampling), or other remediation consistent with the language of the question.

67. Was there ever a spill, leak, release or discharge of a hazardous substance, waste, or material into the Willamette River from any equipment, structure, or activity occurring on, over, or adjacent to the river? If the answer- to the preceding question is anything but an unqualified "no", identify and provide copies of any documents regarding:

a. the nature of the hazardous substance, waste, or material spilled, leaked, released or discharged;

b. the dates of each such occurrence;
c. the amount and location of such release;
d. were sheens on the river created by the release;
e. was there ever a need to remove or dredge any solid waste, bulk product, or other material from the river as a result of the release? If so, please provide information and description of when such removal/dredging occurred, why, and where the removed/dredged materials were disposed.

Response:

During Siltronic's ownership of the property, with one exception, releases of hazardous substances, wastes, or material to the Willamette River were limited to releases through the combined stormwater/NPDES outfall located at the downstream end of the property (City of Portland Outfall number WR-67). The exception is the release of MGP-impacted sediments and sheens to the river resulting from bank repair in 1998, as identified in response to question 62.

The releases via the outfall are also identified in the response to question 62; for these releases, no sheen was observed as a result of the release, and no need to remove or dredge any solid waste, bulk product, or other material from the river has been identified to date.

Prior to Siltronic's ownership, spills, leaks, releases or discharges of hazardous substances, wastes, or material by previous owners or operators (e.g., Northwest Natural, RPAC) have been documented in response to question 62. Please refer to the 104(e) responses for Northwest Natural (ECSI #84) and RPAC (ECSI #155) for additional documentation related to those parties' respective releases to the Willamette River.

68. For any releases or threatened releases of PCB(s), identify the date, quantity, location and type of PCB(s) or PCB(s) containing materials or liquids, and the nature of any response to or cleanup of the release.

Response:

There is no evidence of releases or threatened releases to the environment of PCBs or PCB containing materials.

In 1991 some visible staining was observed on the floor of the hazardous waste storage area, beneath three transformers awaiting disposal. A wipe sample was taken of the concrete floor. The results of the PCB analysis were 2.05 ug/100 cm^2. The following statement was made in the record concerning spill clean-up:

"EPA's Spill Cleanup Policy; Final Rule (1987), uses six (6) spill scenarios to establish site-specific cleanup performance standards, based on the mass of PCBs spilled and the location of the spill, (40 CFR Part 761.125.). The amount of PCBs found on the concrete was non-reportable, and does not fit into any of the six scenarios, because of the low concentration. However, we should consider removing the visible traces of the stain with a double-wash and rinse the area."

The above records are included in the documents produced in response to this request.

69. For any releases or threatened releases of PCB(s) and/or PCB(s) containing materials or liquids, identity and provide copies of any documents regarding the quantity and type of waste generated as a result of the release or threatened release, the disposition of the waste, provide any reports or records relating to the release or threatened release, the response or cleanup and any records relating to any enforcement proceeding relating to the release or threatened release.

Response:

There is no evidence of releases or threatened releases to the environment of PCBs or PCB containing materials.

Section 7.0 Property Investigations

70. Provide information and documentation concerning all inspections, evaluations, safety audits, correspondence and any other documents associated with the conditions, practices, and/or procedures at the Property concerning insurance issues or insurance coverage matters.

Response:

Siltronic interprets this question to seek information and documents related to insurance and insurance coverage issues pertaining to site contamination. Thus any investigation or evaluation unrelated to insurance is not produced again for this question, but is available and identified under other responses.

Siltronic has insured its business operations and property at its Portland, Oregon facility throughout its occupation of the site, which began in 1978. Based on Siltronic's analysis of the insurance policies in effect during that pertinent period, Siltronic believes that insurance coverage for claims related to the Portland Harbor Superfund Site is likely provided by the following companies pursuant to the policies described below:

A. Nationwide Indemnity provides primary general liability coverage pursuant to the following policies of insurance issued by Wausau Insurance Companies:

1. Policy No. 2320 00 039640 (1978-81)
2. Policy No. 2322 00 039640 (1981-82)
3. Policy No. 2323 00 039640 (1982-83)
4. Policy No. 2324 00 039640 (1983-84)
5. Policy No. 2325 00 039640 (1984-85)
6. Policy No. 2326 00 039640 (1985-86)

B. AIG provides umbrella liability coverage under the following policies issued by American International/Granite State:

1. Policy No. 6578-5751 (1978-80)
2. Policy No. 6580-6886 (1980-81)
3. Policy No. 6581-8028 (1981-82)
4. Policy No. 6582-8987 (1982-83)
5. Policy No. 6583-0219 (1983-84)
6. Policy No. 6584-1229 (1984-85)

C. Fireman's Fund provides blanket excess liability coverage under the following policies issued by Fireman's Fund:

1. Policy No. XLX 1217784 (1980-81)
2. Policy No. XLX 1370824 (1982-83)
3. Policy No. XLX 1370811 (1983-84)
4. Policy No. XLX 1370769 (1984-85)

D. Resolute Management, Inc. provides blanket excess liability coverage under Policy No. XBC 052145 issued by Century Indemnity Company, as successor to CCI Insurance Company, as successor to Insurance Company of North America for the period of 1981-82.

E. Mission Insurance Company issued an excess liability policy for the period of 11/1/78 to 1/1/80. This carrier has been liquidated and no coverage will be being provided.

Copies of the insurance policies above are referenced as SCOEPA00094743- SCOEPA00094773.

In 2003, Siltronic tendered its insurance coverage claims to the aforementioned insurance companies. In 2006, Siltronic tendered its claim to the Insurance Company of North America with respect to Policy No. XBC 052145. And in 2006, Siltronic submitted Notices of Lost Policies, pursuant to ORS 465.479 to both AIG and Fireman's Fund. Copies of that correspondence are included in the responsive documents.

Siltronic received the following responses to the above tender letters and notices:

- In June, 2003, shortly after service of its tender to Mission Insurance Company, Siltronic received a letter from CT Corporation advising that it could not accept service on behalf of Mission Insurance Company because they were no longer registered in the State of Oregon.
- In July 2003, Siltronic received Fireman's Fund's reservation of rights letter with respect to coverage under its blanket excess policies.
- In September 2003, Siltronic received notification from Nationwide of its agreement to defend Siltronic, subject to a reservation of rights.

- In January 2004, Siltronic received AIG's reservation of rights letter with respect to its coverage, as well as a disclaimer of coverage with respect to the Granite State Insurance Company Policy No. 6585-2733, effective 1985-86.
- In July and November, 2006, Siltronic received a reservation of rights notification from Resolute Management, Inc. with respect to the Policy No. XBC 052145 issued by Century Indemnity Company, as successor to Insurance Company of North America. In October 2007, Siltronic received a further reservation of rights letter from AIG with respect to its newly discovered Granite State Policy No. 6581-8028, effective 1981-82.

Copies of the above-described correspondence are referenced as SCOEPA00094701-SCOEPA00094705.

Currently, Nationwide Indemnity is funding Siltronic's investigative work pursuant to the defense obligation under the general liability policies issued to Siltronic by Wausau and subject to a full reservation of rights.

Siltronic believes that CGL policies issued after 1986 contain effective exclusions for claims of property damage or injury caused by contamination. These policies and other policies are noted in response to question 79 and 82, and are available if EPA would like to review them. See SCOEPA00095244- SCOEPA00095245.

Insurance related Inspections of hazards on site include the following known inspections:

Date	Insurance/Inspector	Inspection Report Document Number
04/17/2003	Factory Mutual Insurance/FM Global	SCOEPA00094509-SCOEPA00094529
10/30/2001	Royal & SunAlliance/AON Risk Services	SCOEPA00081484-SCOEPA00081485

71. Describe the purpose for, the date of initiation and completion, and the results of any investigations of soil, water (ground or surface), sediment, geology, and hydrology or air quality on or about each Property. Provide copies of all data, reports, and other documents that were generated by you or a consultant, or a federal or state regulatory agency related to the investigations that are described.

Response:

Multiple investigations of environmental media have been completed on the property and have been described in detail to the DEQ. Significant communication files between Siltronic and Northwest Natural, and between Siltronic and the regulatory agencies have been developed and are included in responsive documents produced in electronic format. Copies of data, reports and other documents related to these investigations have also been included in electronic format.

Due to the significant volume of analysis completed, the results of each investigation are not

provided in detail - the CSM Site Summary (provided as part of the LWG's Round 2 Report, and also included in electronic format) adequately summarizes the results of these investigations with respect to impacts to environmental media. In short, the investigations completed to date have confirmed that significant and extensive impacts to soil, groundwater and sediment are present, due primarily to the disposal of MGP-related wastes. The investigations also document groundwater impacts resulting from one or more releases of TCE.

The following timeline provides a summary of the purpose for, dates, and results from investigations completed to date.

1985 – Following a release from the TCE recycling system, potentially-impacted soil was excavated and removed from the site. At DEQ's request, soil samples were collected and analyzed for TCE to confirm the adequacy of the cleanup. No additional investigation (e.g., soil borings, groundwater sampling) was requested. The data were submitted to DEQ by Siltronic; additional description was included in MFA reports.

Also in 1985, an investigation (by CH2M Hill) of soil and groundwater in the southern portion of the property related to a plant expansion found chemicals characteristic of MGP waste and pesticides. The discovery of these chemicals in soil and groundwater resulted in cancellation of plans for the plant expansion.

1987 – On behalf of Northwest Natural, Camp Dresser McKee (CDM) submitted a Work plan for investigation of soil and groundwater impacts related to the MGP waste disposal on the Siltronic and Northwest Natural properties. It does not appear that this work was implemented on the Siltronic property, but the Work plan (included in the documents related to this response) provides additional detail regarding waste generation volumes from the MGP operations.

1988 – EPA (through its contractor Ecology & Environment) completed a Preliminary Assessment (PA) of the Siltronic property for the purposes of "identifying priority sites for remedial action." The PA was initiated in 1987. EPA reviewed existing data and historical information, including the 1985 data, and concluded that no further action was required. EPA recommended that evaluation of the site continue as part of the Doane Lake Investigation.

1990 – Further investigation of soil, groundwater and soil gas was completed by CH2M Hill in support of the Fab 2 expansion. Significant MGP-related impacts to soil, groundwater and soil gas were found, although the report concluded that contribution from the Olympic pipelines could not be ruled out.

1991 – Geraghty & Miller completed a hydrogeological investigation of the Doane Lake Area for the Industrial Group (which included property owners adjacent to Siltronic, but did not include Siltronic). The investigation (begun in 1989) evaluated hydrogeological conditions near the Gould Superfund Site and provided an assessment of the potential impact to a groundwater extraction remedy (at Gould) from area-wide groundwater impacts. The investigation concluded that impacts to a groundwater extraction system from contaminated groundwater would be limited.

1994 - Northwest Natural entered the voluntary cleanup program (VCP, with DEQ) for investigation of nature and extent of MGP-related impacts. Work on the Siltronic property,

however, did not begin until 2001, with soil and groundwater sampling results confirming the presence of MGP-related impacts in soil and groundwater. TCE was also detected in groundwater. Investigation of nature and extent of MGP-related impacts to soil, groundwater, sediment, and surface water is ongoing.

1995 – EPA (through its contractor URS Consultants) completed a Site Inspection Prioritization (SIP) for the Siltronic property. The SIP concludes that a "No Further Action" determination is appropriate for the Siltronic property.

1995 – In preparation for construction of Fab 2, Siltronic removed soil potentially impacted by MGP-related waste and/or petroleum releases from the Olympic pipeline. The soil was treated on-site using thermal desorption consistent with authorization from DEQ.

1997 – EPA (through its contractor Roy F. Weston) completed sediment sampling offshore of Siltronic. The results confirm the presence of MGP-related impacts to sediments.

1999 – Rhone Poulenc AG (RPAC) began investigation of groundwater impacts on the Siltronic property.

2002 – Siltronic's contractor (LTI) collected soil and groundwater samples adjacent to the Fab 1 building. The results suggest that a release of TCE from former USTs has occurred.

Starting in 2002, MFA conducted further investigation of the nature and extent of TCE-related impacts to soil and groundwater. The initial investigations in 2002 and 2003 confirmed that a release of TCE from the former USTs had occurred.

In 2004, DEQ issued a unilateral order (the TCE Order) to Siltronic requiring investigation of the nature and extent of TCE and its degradation products. Additional investigation of TCE-related impacts to soil, groundwater, indoor air quality, transition zone water, surface water, and stormwater were conducted. Investigation activities were completed in 2007, as documented in the Remedial Investigation Report. Pilot-scale evaluations of in-situ technologies for source control were also completed in response to the TCE Order.

Investigations of environmental media on adjacent properties by other Respondents to EPA's 104(e) information requests are not included in this summary.

72. Describe any remediation or response actions you or your agents or consultants have ever taken on each Property either voluntarily or as required by any state or federal agency. If not otherwise already provided under this Information Request, provide copies of all investigations, risk assessments or risk evaluations, feasibility studies, alternatives analysis, implementation plans, decision documents, monitoring plans, maintenance plans, completion reports, or other document concerning remediation or response actions taken on each Property.

Response:

The work and investigations described above (in response to question 71) comprise the bulk of the remedial or response actions (voluntary or otherwise) taken on the property. MFA also prepared a Focused Feasibility Study, which was submitted to DEQ in 2007, and is currently performing a supplemental groundwater investigation to further delineate the source area for implementation of the proposed enhanced in-situ bioremediation as part of the selected source control measure.

73. Are you or your consultants planning to perform any investigations of the soil, water (ground or surface), geology, and hydrology or air quality on or about the Property? If so, identify:
    a. what the nature and scope of these investigations will be;
    b the contractors or other persons that will undertake these investigations;
    c. the purpose of the investigations;
    d. the dates when such investigations will take place and be completed; and
    e. where on the Property such investigations will take place.

    Response:

Investigations of environmental media impacted or potentially impacted by TCE and its degradation products are largely complete for the purposes of the RI. However, additional investigations of soil, surface water, transition zone water, and groundwater by MFA are anticipated in support of remediation activities within the footprint of the TCE plume. The date and scope of such future activities has not yet been determined, as such activities will likely entail coordination with Northwest Natural's investigation and source control activities and are under review by DEQ and EPA.

Contractors for NW Natural and SLLI are continuing RI activities of environmental media on the Siltronic property in order to delineate the nature and extent of MGP-related and pesticide-related impacts (respectively). The scope, contractors, dates, and locations of these investigations are not known at this time. For further documentation of these investigations, please refer to the Section 104(e) responses from those respondents.

Section 8.0 Corporate Information

74. Provide the following information, when applicable, about you and/or your business(es) that are associated with each Property identified in response to Question 4:

    a. state the current legal ownership structure (e.g., corporation, sole proprietorship);
    b. state the names and current addresses of current and past owners of the business entity or, if a corporation, current and past officers and directors;
    c. discuss all changes in the business' legal ownership structure, including any corporate successorship, since the inception of the business entity. For example, a business that starts as a sole proprietorship, but then incorporates after a few years, or a business that

is subsequently acquired by and merged into a successor. Please include the dates and the names of all parties involved;

d. the names and addresses of all current or past business entities or subsidiaries in , which you or your business has or had an interest that have had any operational or ownership connection with the Properties identified in response to Question 4. Briefly describe the business activities of each such identified business entities or subsidiaries; and
e. if your business formerly owned or operated a Property identified in response to Question 4, describe any arrangements made with successor owners or operators regarding liability for environmental contamination or property damage.

Response:

a. Siltronic Corporation, a Delaware Corporation.

Based on EPA's clarifying responses to questions posed about 104(e) responses date 4/8/08,Siltronic is providing the names of past officers and directors. However, the addresses of those individuals is not provided to EPA in this response, but it is available upon further inquiry. See attached SCOEPA00111867- SCOEPA00111880.

b. Wacker Chemical Corporation (WCC) was established on September 1, 1965 from a purchase of MonoSilicon, Inc. located in Gardena, California. Manufacturing operations were relocated from Gardena, CA to Los Angeles, CA. When looking to expand manufacturing facilities, Wacker chose Portland, Oregon for the new facility.

On December 31, 1977, Wacker Chemical Corporation (WCC) closed its Los Angeles operations. WCC relocated to Portland, Oregon on October 1, 1978 becoming a US Holding company. On November 1, 1978, Wacker Siltronic Corporation (WSC) began business operations by taking over the silicon import business of Wacker Chemical Corporation.

Wacker Siltronic Corporation (WSC) began construction of Fab 1 in 1978. The initial production of wafers began in 1980.

In 1985, Wacker Chemical Corporation (WCC) was reincorporated in the state of Delaware.

In late 1995, Wacker Chemical Corporation (WCC) changed its name to Wacker Semiconductor Holding Corporation (WSH) with Wacker Siltronic Corporation (WSC) as the only subsidiary.

In June 2002, Wacker Semiconductor Holding Corporation (WSH) transferred all of the holdings of WSH to Wacker Siltronic Corporation (WSC). As of 2002, WSH's only asset was the investment in WSC.

On January 15, 2004, Wacker Semiconductor Holding Corporation (WSH) officially changed its name to Siltronic Holding Corporation (SHC). In addition, on January 20, 2004, Wacker Siltronic Corporation (WSC) officially changed its name to Siltronic Corporation (SCO).

Effective December 31, 2007, Siltronic Holding Corporation (SHC) was merged into SCO and SHC was dissolved. Siltronic Corporation (SCO) continues in business at the site.

c. Siltronic Corporation (SCO), formerly Wacker Siltronic Corporation (WSC) does not have any subsidiaries, unincorporated divisions or operating units.
d. Not applicable. Although Siltronic Corporation had a name change, the site has been owned by the same company from 1978 to the present date.

75. List all names under which your company or business has ever operated and has ever been incorporated. For each name, provide the following information:

a. whether the company or business continues to exist, indicating the date and means by which it ceased operations (e.g., dissolution, bankruptcy, sale) if it is no longer in business;
b. names, addresses, and telephone numbers of all registered agents, officers, and operations management personnel; and
c. names, addresses, and telephone numbers of all subsidiaries, unincorporated divisions or operating units, affiliates, and parent corporations if any, of the Respondent.

Response:

a. Wacker Siltronic Corporation 1980 to 2004 (name changed)
Siltronic Corporation 2004 to Present

b. Registered Agent: MN Service Corp, 111 SW Fifth Avenue, # 3500, Portland, OR 97204. See response to Question 74 for all officers and directors of the company. See questions 2, 38, and 80 for names of personnel with information relevant to this information request.

c. Siltronic Corporation does not have any subsidiaries, unincorporated divisions or operating units.

Parent Company: Siltronic AG
Hanns-Seidel-Platz 4
81737 München
Germany
Phone +49 89 8564-3000

Affiliates: Siltronic Japan Corporation
3434 Shimata
Hikari, Yamaguchi Prefecture 743-0063
Japan
Tel: +81 833 72-8100

Siltronic Singapore Pte. Ltd.
Tampines Industrial Avenue 5 10
528820 Singapore
Singapore
Tel: +65 65 49-6000

Siltronic Asia Pte. Ltd
Tampines Industrial Avenue 5 10
528820 Singapore
Singapore
Tel: +65 65 49-6000

76. Provide all copies of the Respondent's authority to do business in Oregon. Include all authorizations, withdrawals, suspensions and reinstatements.

Response:

Siltronic Corporation
Business Registry Nr. 015267-22
Registry date 07/03/1978

There are no withdrawals, suspensions or reinstatements.

Source: State of Oregon Business Registry
http://egov.sos.state.or.us/br/pkg_web_name_srch_inq.show_detl?p_be_rsn=418594&p_srce=BR_INQ&p_print=FALSE

77. If Respondent is, or was at any time, a subsidiary of, otherwise owned or controlled by, or otherwise affiliated with another corporation or entity, then describe the full nature of each such corporate relationship, including but not limited to:

a. a general statement of the nature of relationship, indicating whether or not the affiliated entity had, or exercised, any degree of control over the daily operations or decision-making of the Respondent's business operations at the Site;
b. the dates such relationship existed;
c. the percentage of ownership of Respondent that is held by such other entity(ies);
d. for each such affiliated entity provide the names and complete addresses of its parent, subsidiary, and otherwise affiliated entities, as well as the names and addresses of each such affiliated entity's officers, directors, partners, trustees, beneficiaries, and/or shareholders owning more than five percent of that affiliated entity's stock;
e. provide any and all insurance policies for. such affiliated entity(ies) which may possibly cover the liabilities of the Respondent at each Property, and
f. provide any and all corporate financial information of such affiliated entities, including but not limited to total revenue or total sales, net income, depreciation, total assets and total current assets, total liabilities and total current liabilities, net working capital (or net current assets), and net worth.

Response:

a. Siltronic Corporation, formerly Wacker Siltronic Corporation, has always been a subsidiary of a parent company. The parent company has not and does not exercise any degree of control over the daily operations or decision-making of the business operations at the Site.

Wacker Chemical Corporation (WCC) was established on September 1, 1965, as a directly owned subsidiary of Wacker Chemie GmbH. As discussed in question 74, above, WCC relocated to Portland, Oregon on October 1, 1978 becoming a US Holding company. On November 1, 1978, Wacker Siltronic Corporation (WSC) began business operations by taking over the silicon import business of Wacker Chemical Corporation. Wacker Chemical Corporation (Holding company) thus owned 100% of the shares of Wacker Siltronic Corporation, a Delaware corporation, established in 1978.

In 1985, Wacker Chemical Corporation was reincorporated in the state of Delaware.

In late 1995, a corporate restructuring took place, whereby Wacker Chemical Corporation changed its name to Wacker Semiconductor Holding Corporation (WSH) with Wacker Siltronic Corporation as its only subsidiary.

In June 2002, Wacker Semiconductor Holding transferred all of the holdings of WSH to Wacker Siltronic Corporation. As of 2002, WSH's only asset was the investment in WSC.

On January 15, 2004, Wacker Semiconductor Holding Corporation officially changed its name to Siltronic Holding Corporation (SHC). In addition, on January 20, 2004, Wacker Siltronic Corporation officially changed its name to Siltronic Corporation (SCO). As part of the name change, SCO's parent company, Wacker Siltronic AG, changed its name to Siltronic AG.

Effective December 31, 2007, Siltronic Holding Corporation was merged into SCO and SHC was dissolved. Ownership of Siltronic Corporation is now 100% by Siltronic AG, Munich Germany.

b. Dates of ownership by parent companies 1978-1995 100% ownership: Wacker Chemical Corporation 1995-2002 100% ownership: Wacker Semiconductor Holding Corporation (name change of WCC)2002-2004 100% ownership: Wacker Semiconductor Holding Corporation 2004-2007 100% ownership: Siltronic AG (Name change of Wacker Siltronic AG)

c. As outlined above, Siltronic Corporation has always been 100% owned by a parent company. Because of the merger with its first parent, Semiconductor Holding Corporation (f.k.a. Wacker Semiconductor Holding Corporation f.k.a. Wacker Chemical Corporation), that parent no longer exists and Siltronic is owned by the original parent's parent Siltronic AG (f.k.a. Wacker Siltronic AG).

d. Parent Company: Siltronic AG
Hanns-Seidel-Platz 4
81737 Munchen

Germany
Phone 011+49 89 8564 3000

e. The German parent companies did not procure liability insurance for Siltronic Corporation. SCO always procured its own liability insurance.

f. A 2007 Annual Report is provided with this response.

78. If Respondent is a partnership, please describe the partnership and provide a history of the partnership's existence. Provide a list of all current and past partners of any status (e.g., general, limited, etc.) and provide copies of all documents that created, govern, and otherwise rules the partnership, including any amendments or modifications to any of the originals of such documents, and at least five years of partnership meeting minutes.

Response:

Not applicable. As explained in the questions above, the respondent is a corporation.

Section 9.0 Compliance With This Request

79. Describe all sources reviewed or consulted in responding to this request, including, but not limited to:

a. the name and current job title of all individuals consulted;
b. the location where all sources reviewed are currently reside; and
c. the date consulted.

Response:

a. All persons consulted are listed in the response to question 2, above. Siltronic understands that EPA has agreed to permit respondents to refrain from providing residence addresses of persons consulted provided that information is available on request.

b. The following table describes the sources reviewed and the location of those sources:

Source Location	Source Description
Gary Harinski	Annual tax bills and Multnomah County Tax information
Jordan Schrader Ramis, PC	Insurance policies 1978-1986
Maul Foster & Alongi, Inc.	Consultant letters, data, and reports, and incorporated references
Maul Foster & Alongi, Inc.	Historic information on former owners and operators

Maul Foster & Alongi, Inc.	RI/FS (MFA, 2007) and incorporated references
Miller Nash files	Permanent Corporate files
Miller Nash files	Property deeds and information, Installment Sale Agreement, Port of Portland Ordinances
SAIF claims office	Workers compensation claim information, medical records, and SAIF personnel
Secretary of State Webpage	Public records
Siltronic Central Documentation	Siltronic Plans, Policies and Procedures
Siltronic Corporation; Jordan Schrader Ramis; Davis Rothwell; Multnomah County records, Oregon Title Insurance Company	Multnomah County property records
Siltronic Electronic Document System/ Intranet	Siltronic Policies and Procedure
Siltronic Engineering Doc.	Engineering projects, historical equipment files, pipe photos and equipment specifications
Siltronic Engineering Documentation	Primary drawings and reference drawings of floor drains, under-slab drain pipes, and underground drain pipes
Siltronic Engineering Documentation	Pipe repair files
Siltronic Engineering Documentation	Project Folders related to maintenance, installations, removals, improvements
Siltronic Engineering Documentation	Siltronic Site plans and Drawings, history, capital projects, construction photos, construction files, aerial photographs
Siltronic Environmental Affairs	Chemical Use Request & Approval Forms, MSDS file books, Waste Determination and Characterization notebooks, and the Chromic Acid File.
Siltronic Environmental Affairs	Environmental Affairs Files, Environmental Affairs File Outline, files concerning permits and notices
Siltronic Environmental Affairs	Hazardous waste manifests, ODEQ Hazardous Waste Reports, Non-hazardous waste invoices/bill of ladings.
Siltronic Environmental Affairs	Historic environmental files
Siltronic Environmental Affairs	Permit files

Siltronic Environmental Affairs	Records on chemical use, waste disposal records.
Siltronic Environmental Affairs	Riverbank Incident files, spill reports, sediment analysis, contracts, waste records
Siltronic Environmental Affairs	SAP data
Siltronic Environmental Affairs	Tom McCue, Siltronic Organizational charts/historic job descriptions
Siltronic Environmental Affairs	Uniform hazardous waste manifests, hazardous waste determinations, waste profiles, solid waste permits, and correspondence files
Siltronic Environmental Affairs	Electronic files, reports, procedures, databases, inventories, surveys, tables and spreadsheets. Electronic files; Aspect Database, Chemical information database, SAP Database, Electronic files.
Siltronic Environmental Affairs	Transformer testing and disposal records, EPA inspection records regarding PCBs
Siltronic Environmental files	Aerial photos from historic environmental files
Siltronic Environmental files; copies in Jordan Schrader files; copies in Davis Rothwell Earle & X chihua files	Historical files of former counsel for Siltronic, Marvin B. Durning, including 1989 correspondence to and from DEQ and EPA, and various attached exhibits (including Site History prepared by PDC in 1985)
Siltronic Environmental Records	Source documents on chemicals, Environmental project files, Environmental plans, tank and chemical inventories, hazardous waste records, process flow descriptions
Siltronic Executive Offices	Corporate information, corporate history and aerial photos
Siltronic Fab1 Office	Site Engineering & Maintenance records
Siltronic Facilities Engineering	Electric Power Substation Easement, Electric Power Line Easement, and easement drawing; PGE Contracts

Siltronic Facilities Engineering	PCB reports and files
Siltronic Facilities Maintenance Files	Landscaping contractor records
Siltronic Facilities Operations	Historical HazMat plan
Siltronic Finance files	Deed and Easement files
Siltronic Finance files	Finance and Bonding information, Easement documents, US GAAP Financial reports; 1979, 1980, 1996, 2007
Siltronic Finance files	US GAAP Financial Reports
Siltronic Health & Safety	Customer audits
Siltronic Health & Safety	ERT Reports, Fire Inspection Reports (to 2000) *Radiation* folders, Radiation source removal (Cesium,) OR State Fire Marshal Hazardous Substances Survey.
Siltronic Health & Safety	OSHA Oregon logs and incident reports, State Fire Marshal, Oregon Health Division, Radiation protection agency, SHARP files, compliance audit reports; Internal inspections, ISO reports, customer audits.
Siltronic Health & Safety	State Fire Marshal reports and X-ray license and related files on CZ source
Siltronic Health & Safety	Workers compensation files
Siltronic Health & Safety; outside database contractor (OHSU)	Material Safety Data Sheets
Siltronic Human Resources	ERT captains and members
Siltronic Human Resources	Job descriptions, organizational charts, employee files
Siltronic Human Resources	Job functions and reporting information
Siltronic Human Resources	Personnel files
Siltronic intranet	Intranet health and safety projects, waste files
Siltronic intranet	Nonhazardous waste and recycling vendor information
Siltronic intranet	Policies and Procedures
Siltronic Material Characterization Lab	Lab chemical usage documents
Siltronic Purchasing Office	Purchasing Records, Current PGE contract
Siltronic Quality Management	Process Descriptions

Siltronic SAP Database	Maintenance work orders and purchase orders (drain and pipes maintenance and replacement)
Siltronic tax office	Insurance policies 1978-1986
Siltronic WWTP Plant Operations	Waste Water Treatment Plant Operations and Maintenance Manual, documentation
Siltronic, Davis Rothwell Earle & X chihua files, Maul Foster Alongi files	Department of State Lands documents and opinions; Metro-Regional Land Information System (RLIS)
United States Department of the Interior Geological Survey (USGS)	Linnton Quadrangle, Oregon, 7.5min Series (Topographic). Linnton, OR #45122-E7-TF-024, 1990

c. The above persons and records were consulted between January 18, 2008 and August 8, 2008. Many of these sources were consulted on multiple occasions in preparation of this response.

80. If not already provided, identify and provide a last known address or phone number for all persons, including Respondent's current and former employees or agents, other than attorneys, who have knowledge or information about the generation, use, purchase, storage, disposal, placement, or other handling of hazardous materials at, or transportation of hazardous substances, waste, or materials to or from, each Property identified in response to Question 4.

Response:

As explained in Question 38, above, given the nature of Siltronic's operations, if this question is strictly construed, almost every current or former employee has some knowledge on generation, use, purchase, storage, disposal, placement, or other handling of hazardous materials at, or transportation of hazardous substances, waste, or materials to or from the property. Siltronic therefore reasonably construes the question to seek those who are most knowledgeable of the company's activities in these areas at the management level, and those with specific knowledge of the events described elsewhere in this response. In addition to those persons identified in response to Question 2 (persons assisting with response) and Question 38 (persons responsible for environmental affairs), the following persons have knowledge that should cover these topics and events for the years at issue in a meaningful way without being overly cumulative or duplicative.

Steve Beiswenger – Facilities Engineer
Kirk Benson ERT Coordinator
Andrea Buchholz, Health & Safety Engineer
Don Crane –Manager of Health & Safety
Dave Cummings – Facilities Engineer
Thuc Do – Electrical Engineer
Ann Dufresne – Process Engineer
Jim Harper –Director, Human Resources
Jerry Linden – Facilities Operations Supervisor
Dave Locke – Facilities Engineer
Ken Kemper – Facilities Maintenance
Tim Kirk – Facilities Engineer
Dennis Netsch: Manager of Health & Safety
Dave Stalder – Maintenance Supervisor
Tom Voit – Facilities Electrician
Jay Zuiderveld – Machine Shop Supervisor

Siltronic understands that EPA has given all Portland Harbor respondents permission to provide names only at this time, with the understanding that any respondent who provides names only will make addresses and phone numbers available to EPA on request. Also, if EPA seeks greater breadth of information from various current or former employees, or would like to know some specific information about a specific incident, Siltronic is willing to provide such information on request.

81. If any of the documents solicited in this information request are no longer available, please

indicate the reason why they are no longer available. If the records were destroyed, provide us with the following:

a. the document retention policy between 1937 and the present;
b. the approximate date of destruction;
c. a description of the type of information that would have been contained in the documents;
d. the name, job title and most current address known by you of the person(s) who would have produced these documents; the person(s) who would have been responsible for the retention of these documents; the person(s) who would have been responsible for destroying the documents; and the person(s) who had and/or still have the originals or copies of these documents; and
e. the names and most current addresses of any person(s) who may possess documents relevant to this inquiry.

Response:

a. The current document retention policy and procedures are contained in Siltronic document numbers P-10.10.01/0003 (Control of External Standards and Documents, Policy) (SCOEPA00124814-SCOEPA00124826) and P-09.99.02/0015 (SCO Records, Procedure) (SCOEPA00124763-SCOEPA00124813) . The Document retention policy explains the types of records , the approximate date of destruction, the type of information contained in the records, and the person who would have been responsible for retention and/or destruction. Where anomalies exist, the particular missing information is described in the text of the individual questions, above.

<u>Obsolete document retention policies and prior versions of policies and procedures.</u>

b. Under the current policy, obsolete document retention policies are not retained by Central documentation longer than 5 years. P-09.99.02/0015, (SCOEPA00124763-SCOEPA00124813)at p. 41.
c. Obsolete document retention policies would have contained the policies and procedures for maintaining and destroying records that would have been in effect prior to 2003.
d. Mike Pierce, QMS Manager
e. Central Documentation, manager in 2003 or earlier.

82. Provide a description of all records available to you that relate to all of the questions in this request, but which have not been included in your responses.

Response:

The records and other information sources that are available and may relate to the questions in this request but have not been produced are described on lists that are responsive to

this question. Please note that these sources have been consulted as described in question 79, but are voluminous or dynamic (constantly changing) information sources. In that sense the critical information from these sources has been included in preparing this response. Sources have been consulted as indicated, but have not been produced in complete form because they contain nonresponsive information or quantities of data that are duplicative of more concise reports that have been produced.